

APPENDIX II

USEFUL TABLES

Table AII-1.—Natural Sines and Cosines

M I N	0°		1°		2°		3°		4°		M I N
	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS	
0	0.000000	1.00000	0.01745	0.99985	0.03490	0.99939	0.05234	0.99863	0.06976	0.99756	60
1	0.00029	1.00000	0.01774	0.99984	0.03519	0.99938	0.05263	0.99861	0.07005	0.99754	59
2	0.00058	1.00000	0.01803	0.99984	0.03548	0.99937	0.05292	0.99860	0.07034	0.99752	58
3	0.00087	1.00000	0.01832	0.99983	0.03577	0.99936	0.05321	0.99858	0.07063	0.99750	57
4	0.00116	1.00000	0.01862	0.99983	0.03606	0.99935	0.05350	0.99857	0.07092	0.99748	56
5	0.00145	1.00000	0.01891	0.99982	0.03635	0.99934	0.05379	0.99855	0.07121	0.99746	55
6	0.00175	1.00000	0.01920	0.99982	0.03664	0.99933	0.05408	0.99854	0.07150	0.99744	54
7	0.00204	1.00000	0.01949	0.99981	0.03693	0.99932	0.05437	0.99852	0.07179	0.99742	53
8	0.00233	1.00000	0.01978	0.99980	0.03723	0.99931	0.05466	0.99851	0.07208	0.99740	52
9	0.00262	1.00000	0.02007	0.99980	0.03752	0.99930	0.05495	0.99849	0.07237	0.99738	51
10	0.00291	1.00000	0.02036	0.99979	0.03781	0.99929	0.05524	0.99847	0.07266	0.99736	50
11	0.00320	0.99999	0.02065	0.99979	0.03810	0.99927	0.05553	0.99846	0.07295	0.99734	49
12	0.00349	0.99999	0.02094	0.99978	0.03839	0.99926	0.05582	0.99844	0.07324	0.99731	48
13	0.00378	0.99999	0.02123	0.99977	0.03868	0.99925	0.05611	0.99842	0.07353	0.99729	47
14	0.00407	0.99999	0.02152	0.99977	0.03897	0.99924	0.05640	0.99841	0.07382	0.99727	46
15	0.00436	0.99999	0.02181	0.99976	0.03926	0.99923	0.05669	0.99839	0.07411	0.99725	45
16	0.00465	0.99999	0.02211	0.99976	0.03955	0.99922	0.05698	0.99838	0.07440	0.99723	44
17	0.00495	0.99999	0.02240	0.99975	0.03984	0.99921	0.05727	0.99836	0.07469	0.99721	43
18	0.00524	0.99999	0.02269	0.99974	0.04013	0.99919	0.05756	0.99834	0.07498	0.99719	42
19	0.00553	0.99998	0.02298	0.99974	0.04042	0.99918	0.05785	0.99833	0.07527	0.99716	41
20	0.00582	0.99998	0.02327	0.99973	0.04071	0.99917	0.05814	0.99831	0.07556	0.99714	40
21	0.00611	0.99998	0.02356	0.99972	0.04100	0.99916	0.05844	0.99829	0.07585	0.99712	39
22	0.00640	0.99998	0.02385	0.99972	0.04129	0.99915	0.05873	0.99827	0.07614	0.99710	38
23	0.00669	0.99998	0.02414	0.99971	0.04159	0.99913	0.05902	0.99826	0.07643	0.99708	37
24	0.00698	0.99998	0.02443	0.99970	0.04188	0.99912	0.05931	0.99824	0.07672	0.99705	36
25	0.00727	0.99997	0.02472	0.99969	0.04217	0.99911	0.05960	0.99822	0.07701	0.99703	35
26	0.00756	0.99997	0.02501	0.99969	0.04246	0.99910	0.05989	0.99821	0.07730	0.99701	34
27	0.00785	0.99997	0.02530	0.99968	0.04275	0.99909	0.06018	0.99819	0.07759	0.99699	33
28	0.00814	0.99997	0.02560	0.99967	0.04304	0.99907	0.06047	0.99817	0.07788	0.99696	32
29	0.00844	0.99996	0.02589	0.99966	0.04333	0.99906	0.06076	0.99815	0.07817	0.99694	31
30	0.00873	0.99996	0.02618	0.99966	0.04362	0.99905	0.06105	0.99813	0.07846	0.99692	30
31	0.00902	0.99996	0.02647	0.99965	0.04391	0.99904	0.06134	0.99812	0.07875	0.99689	29
32	0.00931	0.99996	0.02676	0.99964	0.04420	0.99902	0.06163	0.99810	0.07904	0.99687	28
33	0.00960	0.99995	0.02705	0.99963	0.04449	0.99901	0.06192	0.99808	0.07933	0.99685	27
34	0.00989	0.99995	0.02734	0.99963	0.04478	0.99900	0.06221	0.99806	0.07962	0.99683	26
35	0.01018	0.99995	0.02763	0.99962	0.04507	0.99898	0.06250	0.99804	0.07991	0.99680	25
36	0.01047	0.99995	0.02792	0.99961	0.04536	0.99897	0.06279	0.99803	0.08020	0.99678	24
37	0.01076	0.99994	0.02821	0.99960	0.04565	0.99896	0.06308	0.99801	0.08049	0.99676	23
38	0.01105	0.99994	0.02850	0.99959	0.04594	0.99894	0.06337	0.99799	0.08078	0.99673	22
39	0.01134	0.99994	0.02879	0.99959	0.04623	0.99893	0.06366	0.99797	0.08107	0.99671	21
40	0.01164	0.99993	0.02908	0.99958	0.04653	0.99892	0.06395	0.99795	0.08136	0.99668	20
41	0.01193	0.99993	0.02938	0.99957	0.04682	0.99890	0.06424	0.99793	0.08165	0.99666	19
42	0.01222	0.99993	0.02967	0.99956	0.04711	0.99889	0.06453	0.99792	0.08194	0.99664	18
43	0.01251	0.99992	0.02996	0.99955	0.04740	0.99888	0.06482	0.99790	0.08223	0.99661	17
44	0.01280	0.99992	0.03025	0.99954	0.04769	0.99886	0.06511	0.99788	0.08252	0.99659	16
45	0.01309	0.99991	0.03054	0.99953	0.04798	0.99885	0.06540	0.99786	0.08281	0.99657	15
46	0.01338	0.99991	0.03083	0.99952	0.04827	0.99883	0.06569	0.99784	0.08310	0.99654	14
47	0.01367	0.99991	0.03112	0.99952	0.04856	0.99882	0.06598	0.99782	0.08339	0.99652	13
48	0.01396	0.99990	0.03141	0.99951	0.04885	0.99881	0.06627	0.99780	0.08368	0.99649	12
49	0.01425	0.99990	0.03170	0.99950	0.04914	0.99879	0.06656	0.99778	0.08397	0.99647	11
50	0.01454	0.99989	0.03199	0.99949	0.04943	0.99878	0.06685	0.99776	0.08426	0.99644	10
51	0.01483	0.99989	0.03228	0.99948	0.04972	0.99876	0.06714	0.99774	0.08455	0.99642	9
52	0.01513	0.99989	0.03257	0.99947	0.05001	0.99875	0.06743	0.99772	0.08484	0.99639	8
53	0.01542	0.99988	0.03286	0.99946	0.05030	0.99873	0.06773	0.99770	0.08513	0.99637	7
54	0.01571	0.99988	0.03316	0.99945	0.05059	0.99872	0.06802	0.99768	0.08542	0.99635	6
55	0.01600	0.99987	0.03345	0.99944	0.05088	0.99870	0.06831	0.99766	0.08571	0.99632	5
56	0.01629	0.99987	0.03374	0.99943	0.05117	0.99869	0.06860	0.99764	0.08600	0.99630	4
57	0.01658	0.99986	0.03403	0.99942	0.05146	0.99867	0.06889	0.99762	0.08629	0.99627	3
58	0.01687	0.99986	0.03432	0.99941	0.05175	0.99866	0.06918	0.99760	0.08658	0.99625	2
59	0.01716	0.99985	0.03461	0.99940	0.05205	0.99864	0.06947	0.99758	0.08687	0.99622	1
60	0.01745	0.99985	0.03490	0.99939	0.05234	0.99863	0.06976	0.99756	0.08714	0.99619	0

COS	SIN	COS	M I N								
89°	88°	87°	86°	85°							I N

Table AII-1.—Natural Sines and Cosines—Continued

M	5°	6°	7°	8°	9°							
I	N	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS	
0	0.08716	0.99619	0.10453	0.99452	0.12187	0.99255	0.13917	0.99027	0.15643	0.98769	0.160	
1	0.08745	0.99617	0.10482	0.99449	0.12216	0.99251	0.13946	0.99023	0.15672	0.98764	0.159	
2	0.08774	0.99614	0.10511	0.99446	0.12245	0.99248	0.13973	0.99019	0.15701	0.98760	0.158	
3	0.08803	0.99612	0.10540	0.99443	0.12274	0.99244	0.14004	0.99015	0.15730	0.98755	0.157	
4	0.08831	0.99609	0.10569	0.99440	0.12302	0.99240	0.14033	0.99011	0.15758	0.98751	0.156	
5	0.08860	0.99607	0.10597	0.99437	0.12331	0.99237	0.14061	0.99006	0.15787	0.98746	0.155	
6	0.08889	0.99604	0.10626	0.99434	0.12360	0.99233	0.14090	0.99002	0.15816	0.98741	0.154	
7	0.08918	0.99602	0.10655	0.99431	0.12389	0.99230	0.14119	0.98998	0.15845	0.98737	0.153	
8	0.08947	0.99599	0.10684	0.99428	0.12418	0.99226	0.14148	0.98994	0.15873	0.98732	0.152	
9	0.08976	0.99596	0.10713	0.99424	0.12447	0.99222	0.14177	0.98990	0.15902	0.98728	0.151	
10	0.09005	0.99594	0.10742	0.99421	0.12476	0.99219	0.14205	0.98986	0.15931	0.98723	0.150	
11	0.09034	0.99591	0.10771	0.99418	0.12504	0.99215	0.14234	0.98982	0.15959	0.98718	0.149	
12	0.09063	0.99588	0.10800	0.99415	0.12533	0.99211	0.14263	0.98978	0.15988	0.98714	0.148	
13	0.09092	0.99586	0.10829	0.99412	0.12562	0.99208	0.14292	0.98973	0.16017	0.98709	0.147	
14	0.09121	0.99583	0.10858	0.99409	0.12591	0.99204	0.14320	0.98969	0.16046	0.98704	0.146	
15	0.09150	0.99580	0.10887	0.99406	0.12620	0.99200	0.14349	0.98965	0.16074	0.98700	0.145	
16	0.09179	0.99578	0.10916	0.99402	0.12649	0.99197	0.14378	0.98961	0.16103	0.98695	0.144	
17	0.09208	0.99575	0.10945	0.99399	0.12678	0.99193	0.14407	0.98957	0.16132	0.98690	0.143	
18	0.09237	0.99572	0.10973	0.99396	0.12706	0.99189	0.14436	0.98953	0.16160	0.98686	0.142	
19	0.09266	0.99570	0.11002	0.99393	0.12735	0.99186	0.14464	0.98948	0.16189	0.98681	0.141	
20	0.09295	0.99567	0.11031	0.99390	0.12764	0.99182	0.14493	0.98944	0.16218	0.98676	0.140	
21	0.09324	0.99564	0.11060	0.99386	0.12793	0.99178	0.14522	0.98940	0.16246	0.98671	0.139	
22	0.09353	0.99562	0.11089	0.99383	0.12822	0.99175	0.14551	0.98936	0.16273	0.98667	0.138	
23	0.09382	0.99559	0.11118	0.99380	0.12851	0.99171	0.14580	0.98931	0.16304	0.98662	0.137	
24	0.09411	0.99556	0.11147	0.99377	0.12880	0.99167	0.14608	0.98927	0.16333	0.98657	0.136	
25	0.09440	0.99553	0.11176	0.99374	0.12908	0.99163	0.14437	0.98923	0.16361	0.98652	0.135	
26	0.09469	0.99551	0.11205	0.99370	0.12937	0.99160	0.14466	0.98919	0.16390	0.98648	0.134	
27	0.09498	0.99548	0.11234	0.99367	0.12966	0.99156	0.14495	0.98914	0.16419	0.98643	0.133	
28	0.09527	0.99545	0.11263	0.99364	0.12995	0.99152	0.14723	0.98910	0.16447	0.98638	0.132	
29	0.09556	0.99542	0.11291	0.99360	0.13024	0.99148	0.14752	0.98906	0.16476	0.98633	0.131	
30	0.09585	0.99540	0.11320	0.99357	0.13053	0.99144	0.14781	0.98902	0.16505	0.98627	0.130	
31	0.09614	0.99537	0.11349	0.99354	0.13081	0.99141	0.14810	0.98897	0.16533	0.98624	0.129	
32	0.09642	0.99534	0.11378	0.99351	0.13110	0.99137	0.14838	0.98893	0.16562	0.98619	0.128	
33	0.09671	0.99531	0.11407	0.99347	0.13139	0.99133	0.14867	0.98889	0.16591	0.98614	0.127	
34	0.09700	0.99528	0.11436	0.99344	0.13168	0.99129	0.14876	0.98884	0.16620	0.98609	0.126	
35	0.09729	0.99526	0.11465	0.99341	0.13197	0.99125	0.14925	0.98880	0.16648	0.98604	0.125	
36	0.09758	0.99523	0.11494	0.99337	0.13226	0.99122	0.14954	0.98876	0.16677	0.98600	0.124	
37	0.09787	0.99520	0.11523	0.99334	0.13254	0.99118	0.14982	0.98871	0.16706	0.98593	0.123	
38	0.09816	0.99517	0.11552	0.99331	0.13283	0.99114	0.15011	0.98867	0.16734	0.98590	0.122	
39	0.09845	0.99514	0.11580	0.99327	0.13312	0.99110	0.15040	0.98863	0.16763	0.98585	0.121	
40	0.09874	0.99511	0.11609	0.99324	0.13341	0.99106	0.15069	0.98858	0.16792	0.98580	0.120	
41	0.09903	0.99508	0.11638	0.99320	0.13370	0.99102	0.15097	0.98854	0.16820	0.98575	0.119	
42	0.09932	0.99506	0.11667	0.99317	0.13399	0.99098	0.15126	0.98849	0.16849	0.98570	0.118	
43	0.09961	0.99503	0.11696	0.99314	0.13427	0.99094	0.15155	0.98845	0.16878	0.98565	0.117	
44	0.09990	0.99500	0.11725	0.99310	0.13456	0.99091	0.15184	0.98841	0.16906	0.98561	0.116	
45	0.10019	0.99497	0.11754	0.99307	0.13485	0.99087	0.15212	0.98836	0.16935	0.98556	0.115	
46	0.10048	0.99494	0.11783	0.99303	0.13514	0.99083	0.15241	0.98832	0.16964	0.98551	0.114	
47	0.10077	0.99491	0.11812	0.99300	0.13543	0.99079	0.15270	0.98827	0.16992	0.98546	0.113	
48	0.10106	0.99488	0.11840	0.99297	0.13572	0.99075	0.15299	0.98823	0.17021	0.98541	0.112	
49	0.10135	0.99485	0.11869	0.99293	0.13600	0.99071	0.15327	0.98818	0.17050	0.98536	0.111	
50	0.10164	0.99482	0.11898	0.99290	0.13629	0.99067	0.15356	0.98814	0.17078	0.98531	0.110	
51	0.10192	0.99479	0.11927	0.99286	0.13658	0.99063	0.15385	0.98809	0.17107	0.98526	0.109	
52	0.10221	0.99476	0.11956	0.99283	0.13687	0.99059	0.15414	0.98805	0.17136	0.98521	0.108	
53	0.10250	0.99473	0.11985	0.99279	0.13716	0.99055	0.15442	0.98800	0.17164	0.98516	0.107	
54	0.10279	0.99470	0.12014	0.99276	0.13744	0.99051	0.15471	0.98796	0.17193	0.98511	0.106	
55	0.10308	0.99467	0.12043	0.99272	0.13773	0.99047	0.15500	0.98791	0.17222	0.98506	0.105	
56	0.10337	0.99464	0.12071	0.99269	0.13802	0.99043	0.15529	0.98787	0.17250	0.98501	0.104	
57	0.10366	0.99461	0.12100	0.99265	0.13831	0.99039	0.15557	0.98782	0.17279	0.98496	0.103	
58	0.10395	0.99458	0.12129	0.99262	0.13860	0.99035	0.15586	0.98778	0.17308	0.98491	0.102	
59	0.10424	0.99455	0.12158	0.99258	0.13889	0.99031	0.15613	0.98773	0.17336	0.98486	0.101	
60	0.10453	0.99452	0.12187	0.99255	0.13917	0.99027	0.15643	0.98769	0.17365	0.98481	0.100	

COS	SIN	COS	M								
84°	83°	82°	81°	80°							X

Table AII-1.—Natural Sines and Cosines—Continued

M	10°	11°	12°	13°	14°						
N	SIN	COS	M								
0	0.17345	0.98481	0.19081	0.98163	0.20791	0.97815	0.22495	0.97437	0.24192	0.97030	60
1	0.17393	0.98476	0.19109	0.98157	0.20820	0.97809	0.22523	0.97430	0.24220	0.97023	59
2	0.17422	0.98471	0.19138	0.98152	0.20848	0.97803	0.22552	0.97424	0.24249	0.97015	58
3	0.17451	0.98466	0.19167	0.98146	0.20877	0.97797	0.22580	0.97417	0.24277	0.97008	57
4	0.17479	0.98461	0.19195	0.98140	0.20905	0.97791	0.22608	0.97411	0.24305	0.97001	56
5	0.17508	0.98455	0.19224	0.98135	0.20933	0.97784	0.22637	0.97404	0.24333	0.96994	55
6	0.17537	0.98450	0.19252	0.98129	0.20962	0.97778	0.22665	0.97398	0.24362	0.96987	54
7	0.17565	0.98445	0.19281	0.98124	0.20990	0.97772	0.22693	0.97391	0.24390	0.96980	53
8	0.17594	0.98440	0.19309	0.98118	0.21019	0.97766	0.22722	0.97384	0.24418	0.96973	52
9	0.17623	0.98435	0.19338	0.98112	0.21047	0.97760	0.22750	0.97378	0.24446	0.96966	51
10	0.17651	0.98430	0.19366	0.98107	0.21076	0.97754	0.22778	0.97371	0.24474	0.96959	50
11	0.17680	0.98425	0.19395	0.98101	0.21104	0.97748	0.22807	0.97365	0.24503	0.96952	49
12	0.17708	0.98420	0.19423	0.98096	0.21132	0.97742	0.22835	0.97358	0.24531	0.96945	48
13	0.17737	0.98414	0.19452	0.98090	0.21161	0.97735	0.22863	0.97351	0.24559	0.96937	47
14	0.17766	0.98409	0.19481	0.98084	0.21189	0.97729	0.22892	0.97345	0.24587	0.96930	46
15	0.17794	0.98404	0.19509	0.98079	0.21218	0.97723	0.22920	0.97338	0.24615	0.96923	45
16	0.17823	0.98399	0.19538	0.98073	0.21246	0.97717	0.22948	0.97331	0.24644	0.96916	44
17	0.17852	0.98394	0.19566	0.98067	0.21275	0.97711	0.22977	0.97325	0.24672	0.96909	43
18	0.17880	0.98389	0.19595	0.98061	0.21303	0.97705	0.23005	0.97318	0.24700	0.96902	42
19	0.17909	0.98383	0.19623	0.98056	0.21331	0.97698	0.23033	0.97311	0.24728	0.96894	41
20	0.17937	0.98378	0.19652	0.98050	0.21360	0.97692	0.23062	0.97304	0.24756	0.96887	40
21	0.17966	0.98373	0.19680	0.98044	0.21388	0.97686	0.23090	0.97298	0.24784	0.96880	39
22	0.17995	0.98368	0.19709	0.98039	0.21417	0.97680	0.23118	0.97291	0.24813	0.96873	38
23	0.18023	0.98362	0.19737	0.98033	0.21445	0.97673	0.23146	0.97284	0.24841	0.96866	37
24	0.18052	0.98357	0.19766	0.98027	0.21474	0.97667	0.23175	0.97278	0.24869	0.96858	36
25	0.18081	0.98352	0.19794	0.98021	0.21502	0.97661	0.23203	0.97271	0.24897	0.96851	35
26	0.18109	0.98347	0.19823	0.98016	0.21530	0.97655	0.23231	0.97264	0.24925	0.96844	34
27	0.18138	0.98341	0.19851	0.98010	0.21559	0.97648	0.23260	0.97257	0.24954	0.96837	33
28	0.18166	0.98336	0.19880	0.98004	0.21587	0.97642	0.23288	0.97251	0.24982	0.96829	32
29	0.18195	0.98331	0.19908	0.97998	0.21616	0.97636	0.23316	0.97244	0.25010	0.96822	31
30	0.18224	0.98325	0.19937	0.97992	0.21644	0.97630	0.23345	0.97237	0.25038	0.96815	30
31	0.18252	0.98320	0.19965	0.97987	0.21672	0.97623	0.23373	0.97230	0.25066	0.96807	29
32	0.18281	0.98315	0.19994	0.97981	0.21701	0.97617	0.23401	0.97223	0.25094	0.96800	28
33	0.18309	0.98310	0.20022	0.97975	0.21729	0.97611	0.23429	0.97217	0.25122	0.96793	27
34	0.18338	0.98304	0.20051	0.97969	0.21758	0.97604	0.23458	0.97210	0.25151	0.96786	26
35	0.18367	0.98299	0.20079	0.97963	0.21784	0.97598	0.23486	0.97203	0.25179	0.96778	25
36	0.18395	0.98294	0.20108	0.97958	0.21814	0.97592	0.23514	0.97196	0.25207	0.96771	24
37	0.18424	0.98288	0.20136	0.97952	0.21843	0.97585	0.23542	0.97189	0.25235	0.96764	23
38	0.18452	0.98283	0.20163	0.97946	0.21871	0.97579	0.23571	0.97182	0.25263	0.96756	22
39	0.18481	0.98277	0.20193	0.97940	0.21899	0.97573	0.23599	0.97176	0.25291	0.96749	21
40	0.18509	0.98272	0.20222	0.97934	0.21928	0.97566	0.23627	0.97169	0.25320	0.96742	20
41	0.18538	0.98267	0.20250	0.97928	0.21956	0.97560	0.23656	0.97162	0.25348	0.96734	19
42	0.18567	0.98261	0.20279	0.97922	0.21985	0.97553	0.23684	0.97155	0.25376	0.96727	18
43	0.18595	0.98256	0.20307	0.97916	0.22013	0.97547	0.23712	0.97148	0.25404	0.96719	17
44	0.18624	0.98250	0.20336	0.97910	0.22041	0.97541	0.23740	0.97141	0.25432	0.96712	16
45	0.18652	0.98245	0.20364	0.97905	0.22070	0.97534	0.23769	0.97134	0.25460	0.96705	15
46	0.18681	0.98240	0.20393	0.97899	0.22098	0.97528	0.23797	0.97127	0.25488	0.96697	14
47	0.18710	0.98234	0.20421	0.97893	0.22126	0.97521	0.23825	0.97120	0.25516	0.96690	13
48	0.18738	0.98229	0.20450	0.97887	0.22153	0.97515	0.23853	0.97113	0.25545	0.96682	12
49	0.18767	0.98223	0.20478	0.97881	0.22183	0.97508	0.23882	0.97106	0.25573	0.96675	11
50	0.18795	0.98218	0.20507	0.97875	0.22212	0.97502	0.23910	0.97100	0.25601	0.96667	10
51	0.18824	0.98212	0.20535	0.97869	0.22240	0.97496	0.23938	0.97093	0.25629	0.96660	9
52	0.18852	0.98207	0.20563	0.97863	0.22268	0.97489	0.23966	0.97086	0.25657	0.96653	8
53	0.18881	0.98201	0.20592	0.97857	0.22297	0.97483	0.23993	0.97079	0.25685	0.96645	7
54	0.18910	0.98196	0.20620	0.97851	0.22325	0.97476	0.24023	0.97072	0.25713	0.96638	6
55	0.18938	0.98190	0.20649	0.97845	0.22353	0.97470	0.24051	0.97065	0.25741	0.96630	5
56	0.18967	0.98185	0.20677	0.97839	0.22382	0.97463	0.24079	0.97058	0.25769	0.96623	4
57	0.18995	0.98179	0.20706	0.97833	0.22410	0.97457	0.24108	0.97051	0.25798	0.96615	3
58	0.19024	0.98174	0.20734	0.97827	0.22438	0.97450	0.24136	0.97044	0.25826	0.96608	2
59	0.19052	0.98168	0.20763	0.97821	0.22467	0.97444	0.24164	0.97037	0.25854	0.96600	1
60	0.19081	0.98163	0.20791	0.97815	0.22495	0.97437	0.24192	0.97030	0.25882	0.96593	0

Table AII-1.—Natural Sines and Cosines—Continued

M	15°		16°		17°		18°		19°		
I	N	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS
0	0.25882	0.96593	0.27564	0.96126	0.29237	0.95630	0.30902	0.95106	0.32557	0.94552	60
1	0.25910	0.96585	0.27592	0.96118	0.29265	0.95622	0.30929	0.95097	0.32584	0.94542	59
2	0.25938	0.96578	0.27620	0.96110	0.29293	0.95613	0.30957	0.95088	0.32612	0.94533	58
3	0.25966	0.96570	0.27648	0.96102	0.29321	0.95605	0.30985	0.95079	0.32639	0.94523	57
4	0.25994	0.96562	0.27676	0.96094	0.29348	0.95596	0.31012	0.95070	0.32667	0.94514	56
5	0.26022	0.96555	0.27704	0.96086	0.29376	0.95588	0.31040	0.95061	0.32694	0.94504	55
6	0.26050	0.96547	0.27731	0.96078	0.29404	0.95579	0.31068	0.95052	0.32722	0.94495	54
7	0.26079	0.96540	0.27759	0.96070	0.29432	0.95571	0.31095	0.95043	0.32749	0.94485	53
8	0.26107	0.96532	0.27787	0.96062	0.29460	0.95562	0.31123	0.95033	0.32777	0.94476	52
9	0.26135	0.96524	0.27815	0.96054	0.29487	0.95554	0.31151	0.95024	0.32804	0.94466	51
10	0.26163	0.96517	0.27843	0.96046	0.29515	0.95545	0.31178	0.95015	0.32832	0.94457	50
11	0.26191	0.96509	0.27871	0.96037	0.29543	0.95536	0.31206	0.95006	0.32859	0.94447	49
12	0.26219	0.96502	0.27899	0.96029	0.29571	0.95528	0.31233	0.94997	0.32887	0.94438	48
13	0.26247	0.96494	0.27927	0.96021	0.29599	0.95519	0.31261	0.94988	0.32914	0.94428	47
14	0.26275	0.96486	0.27955	0.96013	0.29626	0.95511	0.31289	0.94979	0.32942	0.94418	46
15	0.26303	0.96479	0.27983	0.96005	0.29654	0.95502	0.31316	0.94970	0.32969	0.94409	45
16	0.26331	0.96471	0.28011	0.95997	0.29682	0.95493	0.31344	0.94961	0.32997	0.94399	44
17	0.26359	0.96463	0.28039	0.95989	0.29710	0.95485	0.31372	0.94952	0.33024	0.94390	43
18	0.26387	0.96456	0.28067	0.95981	0.29737	0.95476	0.31399	0.94943	0.33051	0.94380	42
19	0.26415	0.96448	0.28095	0.95972	0.29765	0.95467	0.31427	0.94933	0.33079	0.94370	41
20	0.26443	0.96440	0.28123	0.95964	0.29793	0.95459	0.31454	0.94924	0.33106	0.94361	40
21	0.26471	0.96433	0.28150	0.95956	0.29821	0.95450	0.31482	0.94915	0.33134	0.94351	39
22	0.26500	0.96425	0.28178	0.95948	0.29849	0.95441	0.31510	0.94906	0.33161	0.94342	38
23	0.26528	0.96417	0.28206	0.95940	0.29876	0.95433	0.31537	0.94897	0.33189	0.94332	37
24	0.26556	0.96410	0.28234	0.95931	0.29904	0.95424	0.31565	0.94888	0.33216	0.94322	36
25	0.26584	0.96402	0.28262	0.95923	0.29932	0.95415	0.31593	0.94878	0.33244	0.94313	35
26	0.26612	0.96394	0.28290	0.95915	0.29960	0.95407	0.31620	0.94869	0.33271	0.94303	34
27	0.26640	0.96386	0.28318	0.95907	0.29987	0.95398	0.31648	0.94860	0.33298	0.94293	33
28	0.26668	0.96379	0.28346	0.95898	0.30015	0.95389	0.31675	0.94851	0.33326	0.94284	32
29	0.26696	0.96371	0.28374	0.95890	0.30043	0.95380	0.31703	0.94842	0.33353	0.94274	31
30	0.26724	0.96363	0.28402	0.95882	0.30071	0.95372	0.31730	0.94832	0.33381	0.94264	30
31	0.26752	0.96355	0.28429	0.95874	0.30098	0.95363	0.31758	0.94823	0.33408	0.94254	29
32	0.26780	0.96347	0.28457	0.95865	0.30126	0.95354	0.31786	0.94814	0.33436	0.94245	28
33	0.26808	0.96340	0.28485	0.95857	0.30154	0.95345	0.31813	0.94805	0.33463	0.94235	27
34	0.26836	0.96332	0.28513	0.95849	0.30182	0.95337	0.31841	0.94795	0.33490	0.94225	26
35	0.26864	0.96324	0.28541	0.95841	0.30209	0.95328	0.31868	0.94786	0.33518	0.94215	25
36	0.26892	0.96316	0.28569	0.95832	0.30237	0.95319	0.31896	0.94777	0.33545	0.94206	24
37	0.26920	0.96308	0.28597	0.95824	0.30265	0.95310	0.31923	0.94768	0.33573	0.94196	23
38	0.26948	0.96301	0.28625	0.95816	0.30292	0.95301	0.31951	0.94758	0.33600	0.94186	22
39	0.26976	0.96293	0.28652	0.95807	0.30320	0.95293	0.31979	0.94749	0.33627	0.94176	21
40	0.27004	0.96285	0.28680	0.95799	0.30348	0.95284	0.32006	0.94740	0.33655	0.94167	20
41	0.27032	0.96277	0.28708	0.95791	0.30376	0.95275	0.32034	0.94730	0.33682	0.94157	19
42	0.27060	0.96269	0.28736	0.95782	0.30403	0.95266	0.32061	0.94721	0.33710	0.94147	18
43	0.27088	0.96261	0.28764	0.95774	0.30431	0.95257	0.32089	0.94712	0.33737	0.94137	17
44	0.27116	0.96253	0.28792	0.95766	0.30459	0.95248	0.32116	0.94702	0.33764	0.94127	16
45	0.27144	0.96246	0.28820	0.95757	0.30486	0.95240	0.32144	0.94693	0.33792	0.94118	15
46	0.27172	0.96238	0.28847	0.95749	0.30514	0.95231	0.32171	0.94684	0.33819	0.94108	14
47	0.27200	0.96230	0.28875	0.95740	0.30542	0.95222	0.32199	0.94674	0.33846	0.94098	13
48	0.27228	0.96222	0.28903	0.95732	0.30570	0.95213	0.32227	0.94665	0.33874	0.94088	12
49	0.27256	0.96214	0.28931	0.95724	0.30597	0.95204	0.32254	0.94656	0.33901	0.94078	11
50	0.27284	0.96206	0.28959	0.95715	0.30625	0.95195	0.32282	0.94646	0.33929	0.94068	10
51	0.27312	0.96198	0.28987	0.95707	0.30653	0.95186	0.32309	0.94637	0.33956	0.94058	9
52	0.27340	0.96190	0.29015	0.95698	0.30680	0.95177	0.32337	0.94627	0.33983	0.94049	8
53	0.27368	0.96182	0.29042	0.95690	0.30708	0.95168	0.32364	0.94618	0.34011	0.94039	7
54	0.27396	0.96174	0.29070	0.95681	0.30736	0.95159	0.32392	0.94609	0.34038	0.94029	6
55	0.27424	0.96166	0.29098	0.95673	0.30763	0.95150	0.32419	0.94599	0.34065	0.94019	5
56	0.27452	0.96158	0.29126	0.95664	0.30791	0.95142	0.32447	0.94590	0.34093	0.94009	4
57	0.27480	0.96150	0.29154	0.95656	0.30819	0.95133	0.32474	0.94580	0.34120	0.93999	3
58	0.27508	0.96142	0.29182	0.95647	0.30846	0.95124	0.32502	0.94571	0.34147	0.93989	2
59	0.27536	0.96134	0.29209	0.95639	0.30874	0.95115	0.32529	0.94561	0.34175	0.93979	1
60	0.27564	0.96126	0.29237	0.95630	0.30902	0.95106	0.32557	0.94552	0.34202	0.93969	0

COS	SIN	COS	M								
74°	73°	72°	71°	70°							I

Table AII-1.—Natural Sines and Cosines—Continued

M	20°				21°				22°				23°				24°			
I	N	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS			
0	0.34202	0.93969	0.35837	0.93358	0.37461	0.92718	0.39073	0.92050	0.40674	0.91355	60									
1	0.34229	0.93959	0.35844	0.93348	0.37488	0.92707	0.39100	0.92039	0.40700	0.91343	59									
2	0.34257	0.93949	0.35891	0.93337	0.37515	0.92697	0.39127	0.92028	0.40727	0.91331	58									
3	0.34284	0.93939	0.35918	0.93327	0.37542	0.92686	0.39153	0.92016	0.40753	0.91319	57									
4	0.34311	0.93929	0.35943	0.93316	0.37569	0.92675	0.39180	0.92005	0.40780	0.91307	56									
5	0.34339	0.93919	0.35973	0.93306	0.37595	0.92664	0.39207	0.91994	0.40806	0.91295	55									
6	0.34366	0.93909	0.36000	0.93295	0.37622	0.92653	0.39234	0.91982	0.40833	0.91283	54									
7	0.34393	0.93899	0.36027	0.93285	0.37649	0.92642	0.39260	0.91971	0.40860	0.91272	53									
8	0.34421	0.93889	0.36054	0.93274	0.37676	0.92631	0.39287	0.91959	0.40886	0.91260	52									
9	0.34448	0.93879	0.36081	0.93264	0.37703	0.92620	0.39314	0.91948	0.40913	0.91248	51									
10	0.34475	0.93869	0.36108	0.93253	0.37730	0.92609	0.39341	0.91936	0.40939	0.91236	50									
11	0.34503	0.93859	0.36135	0.93243	0.37757	0.92598	0.39367	0.91923	0.40966	0.91224	49									
12	0.34530	0.93849	0.36162	0.93232	0.37784	0.92587	0.39394	0.91914	0.40992	0.91212	48									
13	0.34557	0.93839	0.36190	0.93222	0.37811	0.92576	0.39421	0.91902	0.41019	0.91200	47									
14	0.34584	0.93829	0.36217	0.93211	0.37838	0.92565	0.39448	0.91891	0.41045	0.91188	46									
15	0.34612	0.93819	0.36244	0.93201	0.37865	0.92554	0.39474	0.91879	0.41072	0.91176	45									
16	0.34639	0.93809	0.36271	0.93190	0.37892	0.92543	0.39501	0.91868	0.41098	0.91164	44									
17	0.34666	0.93799	0.36298	0.93180	0.37919	0.92532	0.39528	0.91856	0.41125	0.91152	43									
18	0.34694	0.93789	0.36325	0.93169	0.37946	0.92521	0.39555	0.91845	0.41151	0.91140	42									
19	0.34721	0.93779	0.36352	0.93159	0.37973	0.92510	0.39581	0.91833	0.41178	0.91128	41									
20	0.34748	0.93769	0.36379	0.93148	0.37999	0.92499	0.39608	0.91822	0.41204	0.91116	40									
21	0.34775	0.93759	0.36406	0.93137	0.38026	0.92488	0.39635	0.91810	0.41231	0.91104	39									
22	0.34803	0.93748	0.36434	0.93127	0.38053	0.92477	0.39661	0.91799	0.41257	0.91092	38									
23	0.34830	0.93738	0.36461	0.93116	0.38080	0.92466	0.39688	0.91787	0.41284	0.91080	37									
24	0.34857	0.93728	0.36488	0.93106	0.38107	0.92455	0.39715	0.91775	0.41310	0.91068	36									
25	0.34884	0.93718	0.36515	0.93095	0.38134	0.92444	0.39741	0.91764	0.41337	0.91056	35									
26	0.34912	0.93708	0.36542	0.93084	0.38161	0.92432	0.39768	0.91752	0.41363	0.91044	34									
27	0.34939	0.93698	0.36569	0.93074	0.38188	0.92421	0.39795	0.91741	0.41390	0.91032	33									
28	0.34966	0.93688	0.36596	0.93063	0.38215	0.92410	0.39822	0.91729	0.41416	0.91020	32									
29	0.34993	0.93677	0.36623	0.93052	0.38241	0.92399	0.39848	0.91718	0.41443	0.91008	31									
30	0.35021	0.93667	0.36650	0.93042	0.38268	0.92388	0.39875	0.91706	0.41469	0.90996	30									
31	0.35048	0.93657	0.36677	0.93031	0.38295	0.92377	0.39902	0.91694	0.41496	0.90984	29									
32	0.35075	0.93647	0.36704	0.93020	0.38322	0.92366	0.39928	0.91683	0.41522	0.90972	28									
33	0.36102	0.93637	0.36731	0.93010	0.38349	0.92355	0.39955	0.91671	0.41549	0.90960	27									
34	0.33130	0.93626	0.36758	0.92999	0.38376	0.92343	0.39982	0.91660	0.41575	0.90948	26									
35	0.35157	0.93616	0.36785	0.92988	0.38403	0.92332	0.40008	0.91648	0.41602	0.90936	25									
36	0.35184	0.93606	0.36812	0.92978	0.38430	0.92321	0.40035	0.91636	0.41628	0.90924	24									
37	0.35211	0.93596	0.36839	0.92967	0.38456	0.92310	0.40062	0.91625	0.41655	0.90911	23									
38	0.35239	0.93585	0.36867	0.92956	0.38483	0.92299	0.40088	0.91613	0.41681	0.90899	22									
39	0.35266	0.93575	0.36894	0.92945	0.38510	0.92287	0.40115	0.91601	0.41707	0.90887	21									
40	0.35293	0.93565	0.36921	0.92935	0.38537	0.92276	0.40141	0.91590	0.41734	0.90875	20									
41	0.35320	0.93555	0.36948	0.92924	0.38564	0.92265	0.40168	0.91578	0.41760	0.90863	19									
42	0.35347	0.93544	0.36975	0.92913	0.38591	0.92254	0.40195	0.91566	0.41787	0.90851	18									
43	0.35375	0.93534	0.37002	0.92902	0.38617	0.92243	0.40221	0.91555	0.41813	0.90839	17									
44	0.35402	0.93524	0.37029	0.92892	0.38644	0.92231	0.40248	0.91543	0.41840	0.90826	16									
45	0.35429	0.93514	0.37056	0.92881	0.38671	0.92220	0.40275	0.91531	0.41866	0.90814	15									
46	0.35456	0.93503	0.37083	0.92870	0.38698	0.92209	0.40301	0.91519	0.41892	0.90802	14									
47	0.35484	0.93493	0.37110	0.92859	0.38723	0.92198	0.40328	0.91508	0.41919	0.90790	13									
48	0.35511	0.93483	0.37137	0.92849	0.38752	0.92186	0.40355	0.91496	0.41945	0.90778	12									
49	0.35538	0.93472	0.37164	0.92838	0.38778	0.92175	0.40381	0.91484	0.41972	0.90766	11									
50	0.35565	0.93462	0.37191	0.92827	0.38805	0.92164	0.40408	0.91472	0.41990	0.90753	10									
51	0.35592	0.93452	0.37218	0.92816	0.38832	0.92152	0.40434	0.91461	0.42024	0.90741	9									
52	0.35619	0.93441	0.37245	0.92805	0.38859	0.92141	0.40461	0.91449	0.42051	0.90729	8									
53	0.35647	0.93431	0.37272	0.92794	0.38886	0.92130	0.40488	0.91437	0.42077	0.90717	7									
54	0.35674	0.93420	0.37299	0.92784	0.38912	0.92119	0.40514	0.91425	0.42104	0.90704	6									
55	0.35701	0.93410	0.37326	0.92773	0.38939	0.92107	0.40541	0.91414	0.42130	0.90692	5									
56	0.35728	0.93400	0.37353	0.92762	0.38966	0.92096	0.40567	0.91402	0.42156	0.90680	4									
57	0.35755	0.93389	0.37380	0.92751	0.38993	0.92085	0.40594	0.91390	0.42183	0.90668	3									
58	0.35782	0.93379	0.37407	0.92740	0.39020	0.92073	0.40621	0.91378	0.42209	0.90655	2									
59	0.35810	0.93368	0.37434	0.92729	0.39046	0.92062	0.40647	0.91366	0.42235	0.90643	1									
60	0.35837	0.93358	0.37461	0.92718	0.39073	0.92050	0.40674	0.91355	0.42262	0.90631	0									

Table AII-1.—Natural Sines and Cosines—Continued

M	25°	26°	27°	28°	29°						
I	SIN	COS									
0	0.42262	0.90631	0.43837	0.89879	0.45399	0.89101	0.46947	0.88295	0.48481	0.87462	60
1	0.42288	0.90618	0.43863	0.89867	0.45425	0.89087	0.46973	0.88281	0.48506	0.87448	59
2	0.42315	0.90606	0.43889	0.89854	0.45451	0.89074	0.46999	0.88267	0.48532	0.87434	58
3	0.42341	0.90594	0.43916	0.89841	0.45477	0.89061	0.47024	0.88254	0.48557	0.87420	57
4	0.42367	0.90582	0.43942	0.89828	0.45503	0.89048	0.47050	0.88240	0.48583	0.87406	56
5	0.42394	0.90569	0.43968	0.89816	0.45529	0.89035	0.47076	0.88226	0.48608	0.87391	55
6	0.42420	0.90557	0.43994	0.89803	0.45554	0.89021	0.47101	0.88213	0.48634	0.87377	54
7	0.42446	0.90545	0.44020	0.89790	0.45580	0.89008	0.47127	0.88199	0.48659	0.87363	53
8	0.42473	0.90532	0.44046	0.89777	0.45606	0.88995	0.47153	0.88185	0.48684	0.87349	52
9	0.42499	0.90520	0.44072	0.89764	0.45632	0.88981	0.47178	0.88172	0.48710	0.87335	51
10	0.42525	0.90507	0.44098	0.89752	0.45658	0.88968	0.47204	0.88158	0.48735	0.87321	50
11	0.42552	0.90495	0.44124	0.89739	0.45684	0.88955	0.47229	0.88144	0.48761	0.87306	49
12	0.42578	0.90483	0.44151	0.89726	0.45710	0.88942	0.47255	0.88130	0.48786	0.87292	48
13	0.42604	0.90470	0.44177	0.89713	0.45736	0.88928	0.47281	0.88117	0.48811	0.87278	47
14	0.42631	0.90458	0.44203	0.89700	0.45762	0.88915	0.47306	0.88103	0.48837	0.87264	46
15	0.42657	0.90446	0.44229	0.89687	0.45787	0.88902	0.47332	0.88099	0.48862	0.87250	45
16	0.42683	0.90433	0.44255	0.89674	0.45813	0.88888	0.47358	0.88075	0.48888	0.87235	44
17	0.42709	0.90421	0.44281	0.89662	0.45839	0.88875	0.47383	0.88062	0.48913	0.87221	43
18	0.42736	0.90408	0.44307	0.89649	0.45865	0.88862	0.47409	0.88048	0.48938	0.87207	42
19	0.42762	0.90396	0.44333	0.89636	0.45891	0.88848	0.47434	0.88034	0.48964	0.87193	41
20	0.42788	0.90383	0.44359	0.89623	0.45917	0.88835	0.47460	0.88020	0.48989	0.87178	40
21	0.42815	0.90371	0.44385	0.89610	0.45942	0.88822	0.47486	0.88006	0.49014	0.87164	39
22	0.42841	0.90358	0.44411	0.89597	0.45968	0.88808	0.47511	0.87993	0.49040	0.87150	38
23	0.42867	0.90346	0.44437	0.89584	0.45994	0.88795	0.47537	0.87979	0.49063	0.87136	37
24	0.42894	0.90334	0.44464	0.89571	0.46020	0.88782	0.47562	0.87965	0.49090	0.87121	36
25	0.42920	0.90321	0.44490	0.89558	0.46046	0.88768	0.47588	0.87951	0.49116	0.87107	35
26	0.42946	0.90309	0.44516	0.89545	0.46072	0.88755	0.47614	0.87937	0.49141	0.87093	34
27	0.42972	0.90296	0.44542	0.89532	0.46097	0.88741	0.47639	0.87923	0.49166	0.87079	33
28	0.42999	0.90284	0.44568	0.89519	0.46123	0.88728	0.47665	0.87909	0.49192	0.87064	32
29	0.43025	0.90271	0.44594	0.89506	0.46149	0.88715	0.47690	0.87896	0.49217	0.87050	31
30	0.43051	0.90259	0.44620	0.89493	0.46175	0.88701	0.47716	0.87882	0.49242	0.87036	30
31	0.43077	0.90246	0.44646	0.89480	0.46201	0.88688	0.47741	0.87868	0.49268	0.87021	29
32	0.43104	0.90233	0.44672	0.89467	0.46226	0.88674	0.47767	0.87854	0.49293	0.87007	28
33	0.43130	0.90221	0.44698	0.89454	0.46252	0.88661	0.47793	0.87840	0.49318	0.86993	27
34	0.43156	0.90208	0.44724	0.89441	0.46278	0.88647	0.47818	0.87826	0.49344	0.86978	26
35	0.43182	0.90196	0.44750	0.89428	0.46304	0.88634	0.47844	0.87812	0.49369	0.86964	25
36	0.43209	0.90183	0.44776	0.89415	0.46330	0.88620	0.47869	0.87798	0.49394	0.86949	24
37	0.43235	0.90171	0.44802	0.89402	0.46355	0.88607	0.47895	0.87784	0.49419	0.86935	23
38	0.43261	0.90158	0.44828	0.89389	0.46381	0.88593	0.47920	0.87770	0.49445	0.86921	22
39	0.43287	0.90146	0.44854	0.89376	0.46407	0.88580	0.47946	0.87756	0.49470	0.86906	21
40	0.43313	0.90133	0.44880	0.89363	0.46433	0.88566	0.47971	0.87743	0.49495	0.86892	20
41	0.43340	0.90120	0.44906	0.89350	0.46458	0.88553	0.47997	0.87729	0.49521	0.86878	19
42	0.43366	0.90108	0.44932	0.89337	0.46484	0.88539	0.48022	0.87715	0.49546	0.86863	18
43	0.43392	0.90095	0.44958	0.89324	0.46510	0.88526	0.48048	0.87701	0.49571	0.86849	17
44	0.43418	0.90082	0.44984	0.89311	0.46536	0.88512	0.48073	0.87687	0.49596	0.86834	16
45	0.43445	0.90070	0.45010	0.89298	0.46561	0.88499	0.48099	0.87673	0.49622	0.86820	15
46	0.43471	0.90057	0.45036	0.89285	0.46587	0.88485	0.48124	0.87659	0.49647	0.86805	14
47	0.43497	0.90045	0.45062	0.89272	0.46613	0.88472	0.48150	0.87645	0.49672	0.86791	13
48	0.43523	0.90032	0.45088	0.89259	0.46639	0.88458	0.48175	0.87631	0.49697	0.86777	12
49	0.43549	0.90019	0.45114	0.89245	0.46664	0.88445	0.48201	0.87617	0.49723	0.86762	11
50	0.43575	0.90007	0.45140	0.89232	0.46690	0.88431	0.48226	0.87603	0.49748	0.86748	10
51	0.43602	0.89974	0.45166	0.89219	0.46716	0.88417	0.48252	0.87589	0.49773	0.86733	9
52	0.43628	0.89981	0.45192	0.89206	0.46742	0.88404	0.48277	0.87575	0.49798	0.86719	8
53	0.43654	0.89968	0.45218	0.89193	0.46767	0.88390	0.48303	0.87561	0.49824	0.86704	7
54	0.43680	0.89956	0.45243	0.89180	0.46793	0.88377	0.48328	0.87546	0.49849	0.86690	6
55	0.43706	0.89943	0.45269	0.89167	0.46819	0.88363	0.48354	0.87532	0.49874	0.86675	5
56	0.43733	0.89930	0.45295	0.89153	0.46844	0.88349	0.48379	0.87518	0.49899	0.86661	4
57	0.43759	0.89918	0.45321	0.89140	0.46870	0.88336	0.48405	0.87504	0.49924	0.86646	3
58	0.43785	0.89905	0.45347	0.89127	0.46896	0.88322	0.48430	0.87490	0.49950	0.86632	2
59	0.43811	0.89892	0.45373	0.89114	0.46921	0.88308	0.48456	0.87476	0.49975	0.86617	1
60	0.43837	0.89879	0.45399	0.89101	0.46947	0.88295	0.48481	0.87462	0.50000	0.86603	0

M	COS	SIN	M								
64°	0.45295	0.89153	0.46844	0.88349	0.48379	0.87518	0.49899	0.86661	0.43733	0.89930	0.45321

Table AII-1.—Natural Sines and Cosines—Continued

M	30°		31°		32°		33°		34°		
I	N	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS
0	0.50000	0.86603	0.51504	0.85717	0.52992	0.84805	0.54464	0.83867	0.55919	0.82904	60
1	0.50025	0.86588	0.51529	0.85702	0.53013	0.84789	0.54488	0.83851	0.55943	0.82867	59
2	0.50050	0.86573	0.51554	0.85687	0.53041	0.84774	0.54513	0.83835	0.55968	0.82871	58
3	0.50076	0.86559	0.51579	0.85672	0.53066	0.84759	0.54537	0.83819	0.55992	0.82855	57
4	0.50101	0.86544	0.51604	0.85657	0.53091	0.84743	0.54561	0.83804	0.56016	0.82839	56
5	0.50126	0.86530	0.51628	0.85642	0.53115	0.84728	0.54586	0.83788	0.56040	0.82822	55
6	0.50151	0.86515	0.51653	0.85627	0.53140	0.84712	0.54610	0.83772	0.56064	0.82804	54
7	0.50176	0.86501	0.51678	0.85612	0.53164	0.84697	0.54635	0.83756	0.56088	0.82790	53
8	0.50201	0.86486	0.51703	0.85597	0.53189	0.84681	0.54659	0.83740	0.56112	0.82773	52
9	0.50227	0.86471	0.51728	0.85582	0.53214	0.84666	0.54683	0.83724	0.56136	0.82757	51
10	0.50252	0.86457	0.51753	0.85567	0.53238	0.84650	0.54708	0.83708	0.56160	0.82741	50
11	0.50277	0.86442	0.51778	0.85551	0.53263	0.84635	0.54732	0.83692	0.56184	0.82724	49
12	0.50302	0.86427	0.51803	0.85536	0.53288	0.84619	0.54756	0.83676	0.56208	0.82708	48
13	0.50327	0.86413	0.51828	0.85521	0.53312	0.84604	0.54781	0.83660	0.56232	0.82692	47
14	0.50352	0.86398	0.51852	0.85506	0.53337	0.84588	0.54805	0.83645	0.56256	0.82675	46
15	0.50377	0.86384	0.51877	0.85491	0.53361	0.84573	0.54829	0.83629	0.56280	0.82659	45
16	0.50403	0.86369	0.51902	0.85476	0.53386	0.84557	0.54854	0.83613	0.56305	0.82643	44
17	0.50428	0.86354	0.51927	0.85461	0.53411	0.84542	0.54878	0.83597	0.56329	0.82626	43
18	0.50453	0.86340	0.51952	0.85446	0.53435	0.84524	0.54902	0.83581	0.56353	0.82610	42
19	0.50478	0.86325	0.51977	0.85431	0.53460	0.84511	0.54927	0.83565	0.56377	0.82593	41
20	0.50503	0.86310	0.52002	0.85416	0.53484	0.84495	0.54951	0.83549	0.56401	0.82577	40
21	0.50528	0.86295	0.52026	0.85401	0.53509	0.84480	0.54975	0.83533	0.56425	0.82561	39
22	0.50553	0.86281	0.52051	0.85383	0.53534	0.84464	0.54999	0.83517	0.56449	0.82544	38
23	0.50578	0.86266	0.52076	0.85370	0.53558	0.84448	0.55024	0.83501	0.56473	0.82528	37
24	0.50603	0.86251	0.52101	0.85355	0.53583	0.84433	0.55048	0.83485	0.56497	0.82511	36
25	0.50628	0.86237	0.52126	0.85340	0.53607	0.84417	0.55072	0.83469	0.56521	0.82495	35
26	0.50654	0.86222	0.52151	0.85325	0.53632	0.84402	0.55097	0.83453	0.56545	0.82478	34
27	0.50679	0.86207	0.52175	0.85310	0.53656	0.84386	0.55121	0.83437	0.56569	0.82462	33
28	0.50704	0.86192	0.52200	0.85294	0.53681	0.84370	0.55145	0.83421	0.56593	0.82446	32
29	0.50729	0.86178	0.52225	0.85279	0.53705	0.84355	0.55169	0.83405	0.56617	0.82429	31
30	0.50754	0.86163	0.52250	0.85264	0.53730	0.84339	0.55194	0.83389	0.56641	0.82413	30
31	0.50779	0.86148	0.52275	0.85249	0.53754	0.84324	0.55218	0.83373	0.56665	0.82396	29
32	0.50804	0.86133	0.52299	0.85234	0.53779	0.84308	0.55242	0.83356	0.56689	0.82380	28
33	0.50829	0.86119	0.52324	0.85218	0.53804	0.84292	0.55266	0.83340	0.56713	0.82363	27
34	0.50854	0.86104	0.52349	0.85203	0.53828	0.84277	0.55291	0.83324	0.56736	0.82347	26
35	0.50879	0.86089	0.52374	0.85188	0.53853	0.84261	0.55315	0.83308	0.56760	0.82330	25
36	0.50904	0.86074	0.52399	0.85173	0.53877	0.84245	0.55339	0.83292	0.56784	0.82314	24
37	0.50929	0.86059	0.52423	0.85157	0.53902	0.84230	0.55363	0.83276	0.56808	0.82297	23
38	0.50954	0.86045	0.52448	0.85142	0.53926	0.84214	0.55388	0.83260	0.56832	0.82281	22
39	0.50979	0.86030	0.52473	0.85127	0.53951	0.84198	0.55412	0.83244	0.56854	0.82264	21
40	0.51004	0.86015	0.52498	0.85112	0.53975	0.84182	0.55436	0.83228	0.56880	0.82248	20
41	0.51029	0.86000	0.52522	0.85096	0.54000	0.84167	0.55460	0.83212	0.56904	0.82231	19
42	0.51054	0.85985	0.52547	0.85081	0.54024	0.84151	0.55484	0.83195	0.56928	0.82214	18
43	0.51079	0.85970	0.52572	0.85066	0.54049	0.84135	0.55509	0.83179	0.56952	0.82178	17
44	0.51104	0.85956	0.52597	0.85051	0.54073	0.84120	0.55533	0.83163	0.56976	0.82161	16
45	0.51129	0.85941	0.52621	0.85035	0.54097	0.84104	0.55557	0.83147	0.57000	0.82165	15
46	0.51154	0.85926	0.52646	0.85020	0.54122	0.84088	0.55581	0.83131	0.57024	0.82148	14
47	0.51179	0.85911	0.52671	0.85005	0.54146	0.84072	0.55605	0.83115	0.57047	0.82132	13
48	0.51204	0.85896	0.52696	0.84989	0.54171	0.84057	0.55630	0.83098	0.57071	0.82115	12
49	0.51229	0.85881	0.52720	0.84974	0.54195	0.84041	0.55654	0.83082	0.57095	0.82098	11
50	0.51254	0.85866	0.52745	0.84959	0.54220	0.84025	0.55678	0.83066	0.57119	0.82082	10
51	0.51279	0.85851	0.52770	0.84943	0.54244	0.84009	0.55702	0.83050	0.57143	0.82065	9
52	0.51304	0.85836	0.52794	0.84928	0.54269	0.83994	0.55726	0.83034	0.57167	0.82048	8
53	0.51329	0.85821	0.52819	0.84913	0.54293	0.83978	0.55750	0.83017	0.57191	0.82032	7
54	0.51354	0.85806	0.52844	0.84897	0.54317	0.83962	0.55775	0.83001	0.57215	0.82015	6
55	0.51379	0.85792	0.52869	0.84882	0.54342	0.83946	0.55799	0.82985	0.57238	0.81999	5
56	0.51404	0.85777	0.52893	0.84866	0.54366	0.83930	0.55823	0.82969	0.57262	0.81982	4
57	0.51429	0.85762	0.52918	0.84851	0.54391	0.83915	0.55847	0.82953	0.57286	0.81965	3
58	0.51454	0.85747	0.52943	0.84836	0.54415	0.83899	0.55871	0.82936	0.57310	0.81949	2
59	0.51479	0.85732	0.52967	0.84820	0.54440	0.83883	0.55895	0.82920	0.57334	0.81932	1
60	0.51504	0.85717	0.52992	0.84805	0.54464	0.83867	0.55919	0.82904	0.57358	0.81915	0

M	COS	SIN	M								
59°	0.52693	0.84866	0.54366	0.83930	0.55823	0.82969	0.57262	0.81982	0.57286	0.81965	3
58°	0.52678	0.84851	0.54391	0.83915	0.55847	0.82953	0.57286	0.81965	0.57310	0.81949	2
57°	0.52663	0.84836	0.54415	0.83899	0.55871	0.82936	0.57310	0.81949	0.57334	0.81932	1
56°	0.52648	0.84820	0.54440	0.83883	0.55895	0.82920	0.57334	0.81932	0.57358	0.81915	0
55°	0.52633	0.84805	0.54464	0.83867	0.55919	0.82904	0.57358	0.81915	0.57382	0.81900	0

Table AII-1.—Natural Sines and Cosines—Continued

M	35°	36°	37°	38°	39°						
I	SIN	COS	SIN	COS	SIN	COS	SIN	COS	SIN	COS	
0	0.57358	0.81915	0.58779	0.80902	0.460182	0.79864	0.61566	0.78801	0.62932	0.77715	60
1	0.57381	0.81899	0.58802	0.80885	0.60205	0.79846	0.61589	0.78783	0.62955	0.77696	59
2	0.57405	0.81882	0.58826	0.80867	0.60228	0.79829	0.61612	0.78765	0.62977	0.77678	58
3	0.57429	0.81865	0.58849	0.80850	0.60251	0.79811	0.61635	0.78747	0.63000	0.77660	57
4	0.57453	0.81848	0.58873	0.80833	0.60274	0.79793	0.61658	0.78729	0.63022	0.77641	56
5	0.57477	0.81832	0.58896	0.80816	0.60298	0.79776	0.61681	0.78711	0.63045	0.77623	55
6	0.57501	0.81815	0.58920	0.80799	0.60321	0.79758	0.61704	0.78694	0.63068	0.77605	54
7	0.57524	0.81798	0.58943	0.80782	0.60344	0.79741	0.61726	0.78676	0.63090	0.77586	53
8	0.57548	0.81782	0.58967	0.80765	0.60367	0.79723	0.61749	0.78658	0.63113	0.77568	52
9	0.57572	0.81765	0.58990	0.80748	0.60390	0.79706	0.61772	0.78640	0.63135	0.77550	51
10	0.57596	0.81748	0.59014	0.80730	0.60414	0.79688	0.61795	0.78622	0.63158	0.77531	50
11	0.57619	0.81731	0.59037	0.80713	0.60437	0.79671	0.61818	0.78604	0.63180	0.77513	49
12	0.57643	0.81714	0.59061	0.80696	0.60460	0.79653	0.61841	0.78584	0.63203	0.77494	48
13	0.57667	0.81698	0.59084	0.80679	0.60483	0.79635	0.61864	0.78568	0.63225	0.77476	47
14	0.57691	0.81681	0.59108	0.80662	0.60506	0.79618	0.61887	0.78550	0.63248	0.77458	46
15	0.57715	0.81664	0.59131	0.80644	0.60529	0.79600	0.61909	0.78532	0.63271	0.77439	45
16	0.57738	0.81647	0.59154	0.80627	0.60553	0.79583	0.61932	0.78514	0.63293	0.77421	44
17	0.57762	0.81631	0.59178	0.80610	0.60576	0.79565	0.61953	0.78496	0.63316	0.77402	43
18	0.57786	0.81614	0.59201	0.80593	0.60599	0.79547	0.61978	0.78478	0.63338	0.77384	42
19	0.57810	0.81597	0.59225	0.80576	0.60622	0.79530	0.62001	0.78460	0.63361	0.77366	41
20	0.57833	0.81580	0.59248	0.80558	0.60645	0.79512	0.62024	0.78442	0.63383	0.77347	40
21	0.57857	0.81563	0.59272	0.80541	0.60668	0.79494	0.62046	0.78424	0.63406	0.77329	39
22	0.57881	0.81546	0.59295	0.80524	0.60691	0.79477	0.62069	0.78405	0.63428	0.77310	38
23	0.57904	0.81530	0.59318	0.80507	0.60714	0.79459	0.62092	0.78387	0.63451	0.77292	37
24	0.57928	0.81513	0.59342	0.80489	0.60738	0.79441	0.62115	0.78369	0.63473	0.77273	36
25	0.57952	0.81496	0.59363	0.80472	0.60761	0.79424	0.62138	0.78351	0.63496	0.77255	35
26	0.57976	0.81479	0.59389	0.80455	0.60784	0.79406	0.62160	0.78333	0.63518	0.77236	34
27	0.57999	0.81462	0.59412	0.80438	0.60807	0.79388	0.62183	0.78315	0.63540	0.77218	33
28	0.58023	0.81445	0.59436	0.80420	0.60830	0.79371	0.62206	0.78297	0.63563	0.77199	32
29	0.58047	0.81428	0.59459	0.80403	0.60853	0.79353	0.62229	0.78279	0.63585	0.77181	31
30	0.58070	0.81412	0.59482	0.80386	0.60876	0.79335	0.62251	0.78261	0.63608	0.77162	30
31	0.58094	0.81395	0.59506	0.80368	0.60899	0.79318	0.62274	0.78243	0.63630	0.77144	29
32	0.58118	0.81378	0.59529	0.80351	0.60922	0.79300	0.62297	0.78225	0.63653	0.77125	28
33	0.58141	0.81361	0.59552	0.80334	0.60945	0.79282	0.62320	0.78206	0.63675	0.77107	27
34	0.58165	0.81344	0.59576	0.80316	0.60968	0.79264	0.62342	0.78188	0.63698	0.77088	26
35	0.58189	0.81327	0.59599	0.80299	0.60991	0.79247	0.62365	0.78170	0.63720	0.77070	25
36	0.58212	0.81310	0.59622	0.80282	0.61015	0.79229	0.62388	0.78152	0.63742	0.77051	24
37	0.58236	0.81293	0.59646	0.80264	0.61038	0.79211	0.62411	0.78134	0.63765	0.77033	23
38	0.58260	0.81276	0.59669	0.80247	0.61061	0.79193	0.62433	0.78116	0.63787	0.77014	22
39	0.58283	0.81259	0.59693	0.80230	0.61084	0.79176	0.62456	0.78098	0.63810	0.76996	21
40	0.58307	0.81242	0.59716	0.80212	0.61107	0.79158	0.62479	0.78079	0.63832	0.76977	20
41	0.58330	0.81225	0.59739	0.80195	0.61130	0.79140	0.62502	0.78061	0.63854	0.76959	19
42	0.58354	0.81208	0.59763	0.80178	0.61153	0.79122	0.62524	0.78043	0.63877	0.76940	18
43	0.58378	0.81191	0.59786	0.80160	0.61176	0.79105	0.62547	0.78025	0.63899	0.76921	17
44	0.58401	0.81174	0.59809	0.80143	0.61199	0.79087	0.62570	0.78007	0.63922	0.76903	16
45	0.58425	0.81157	0.59832	0.80125	0.61222	0.79069	0.62592	0.77998	0.63944	0.76884	15
46	0.58449	0.81140	0.59856	0.80108	0.61245	0.79051	0.62615	0.77970	0.63966	0.76866	14
47	0.58472	0.81123	0.59879	0.80091	0.61268	0.79033	0.62638	0.77952	0.63989	0.76847	13
48	0.58496	0.81106	0.59902	0.80073	0.61291	0.79016	0.62660	0.77934	0.64011	0.76828	12
49	0.58519	0.81089	0.59926	0.80056	0.61314	0.78998	0.62683	0.77916	0.64033	0.76810	11
50	0.58543	0.81072	0.59949	0.80038	0.61337	0.78980	0.62706	0.77897	0.64056	0.76791	10
51	0.58567	0.81055	0.59972	0.80021	0.61360	0.78962	0.62728	0.77879	0.64078	0.76772	9
52	0.58590	0.81038	0.59995	0.80003	0.61383	0.78944	0.62751	0.77861	0.64100	0.76754	8
53	0.58614	0.81021	0.60019	0.79986	0.61406	0.78926	0.62774	0.77843	0.64123	0.76735	7
54	0.58637	0.81004	0.60042	0.79968	0.61429	0.78908	0.62796	0.77824	0.64145	0.76717	6
55	0.58661	0.80987	0.60065	0.79951	0.61451	0.78891	0.62819	0.77806	0.64167	0.76698	5
56	0.58684	0.80970	0.60089	0.79934	0.61474	0.78873	0.62842	0.77788	0.64190	0.76679	4
57	0.58708	0.80953	0.60112	0.79916	0.61497	0.78855	0.62864	0.77769	0.64212	0.76661	3
58	0.58731	0.80936	0.60135	0.79899	0.61520	0.78837	0.62887	0.77751	0.64234	0.76642	2
59	0.58755	0.80919	0.60158	0.79881	0.61543	0.78819	0.62909	0.77733	0.64256	0.76623	1
60	0.58779	0.80902	0.60182	0.79864	0.61566	0.78801	0.62932	0.77715	0.64279	0.76604	0

M	COS	SIN	M								
54°	0.5	0.8660	0.5	0.8660	0.5	0.8660	0.5	0.8660	0.5	0.8660	0.5

Table AII-1.—Natural Sines and Cosines—Continued

M	40°	41°	42°	43°	44°						
N	SIN	COS	M								
0	0.64279	0.76604	0.45606	0.75471	0.66913	0.74314	0.68200	0.73135	0.69466	0.71934	60
1	0.64301	0.76586	0.45628	0.75452	0.66935	0.74295	0.68221	0.73116	0.69487	0.71914	59
2	0.64323	0.76567	0.45650	0.75433	0.66956	0.74276	0.68242	0.73096	0.69508	0.71894	58
3	0.64346	0.76548	0.45672	0.75414	0.66978	0.74256	0.68264	0.73076	0.69529	0.71873	57
4	0.64368	0.76530	0.45694	0.75395	0.66999	0.74237	0.68285	0.73056	0.69549	0.71853	56
5	0.64390	0.76511	0.45716	0.75375	0.67021	0.74217	0.68306	0.73036	0.69570	0.71833	55
6	0.64412	0.76492	0.45738	0.75356	0.67043	0.74198	0.68327	0.73016	0.69591	0.71813	54
7	0.64433	0.76473	0.45759	0.75337	0.67064	0.74178	0.68349	0.72996	0.69612	0.71792	53
8	0.64457	0.76455	0.45781	0.75318	0.67086	0.74159	0.68370	0.72976	0.69633	0.71772	52
9	0.64479	0.76436	0.45803	0.75299	0.67107	0.74139	0.68391	0.72957	0.69654	0.71752	51
10	0.64501	0.76417	0.45825	0.75280	0.67129	0.74120	0.68412	0.72937	0.69675	0.71732	50
11	0.64524	0.76398	0.45847	0.75261	0.67151	0.74100	0.68434	0.72917	0.69696	0.71711	49
12	0.64546	0.76380	0.45868	0.75241	0.67172	0.74080	0.68455	0.72897	0.69717	0.71691	48
13	0.64568	0.76361	0.45891	0.75222	0.67194	0.74061	0.68476	0.72877	0.69737	0.71671	47
14	0.64590	0.76342	0.45913	0.75203	0.67215	0.74041	0.68497	0.72857	0.69758	0.71650	46
15	0.64612	0.76323	0.45935	0.75184	0.67237	0.74022	0.68518	0.72837	0.69779	0.71630	45
16	0.64635	0.76304	0.45956	0.75165	0.67258	0.74002	0.68539	0.72817	0.69800	0.71610	44
17	0.64657	0.76286	0.45978	0.75146	0.67280	0.73983	0.68561	0.72797	0.69821	0.71590	43
18	0.64679	0.76267	0.46000	0.75126	0.67301	0.73963	0.68582	0.72777	0.69842	0.71569	42
19	0.64701	0.76248	0.46022	0.75107	0.67323	0.73944	0.68603	0.72757	0.69862	0.71549	41
20	0.64723	0.76229	0.46044	0.75088	0.67344	0.73924	0.68624	0.72737	0.69883	0.71529	40
21	0.64744	0.76210	0.46066	0.75069	0.67366	0.73904	0.68645	0.72717	0.69904	0.71508	39
22	0.64768	0.76192	0.46088	0.75050	0.67387	0.73885	0.68666	0.72697	0.69925	0.71488	38
23	0.64790	0.76173	0.46109	0.75030	0.67409	0.73865	0.68688	0.72677	0.69946	0.71468	37
24	0.64812	0.76154	0.46131	0.75011	0.67430	0.73846	0.68709	0.72657	0.69966	0.71447	36
25	0.64834	0.76135	0.46153	0.74992	0.67452	0.73826	0.68730	0.72637	0.69987	0.71427	35
26	0.64856	0.76116	0.46175	0.74973	0.67473	0.73806	0.68751	0.72617	0.70008	0.71407	34
27	0.64878	0.76097	0.46197	0.74953	0.67495	0.73787	0.68772	0.72597	0.70029	0.71386	33
28	0.64901	0.76078	0.46218	0.74934	0.67516	0.73767	0.68793	0.72577	0.70049	0.71366	32
29	0.64923	0.76059	0.46240	0.74915	0.67538	0.73747	0.68814	0.72557	0.70070	0.71345	31
30	0.64945	0.76041	0.46262	0.74896	0.67559	0.73728	0.68835	0.72537	0.70091	0.71325	30
31	0.64967	0.76022	0.46284	0.74876	0.67580	0.73708	0.68857	0.72517	0.70112	0.71305	29
32	0.64989	0.76003	0.46306	0.74857	0.67602	0.73688	0.68878	0.72497	0.70132	0.71284	28
33	0.65011	0.75984	0.46327	0.74838	0.67623	0.73669	0.68899	0.72477	0.70153	0.71264	27
34	0.65033	0.75965	0.46349	0.74818	0.67645	0.73649	0.68920	0.72457	0.70174	0.71243	26
35	0.65055	0.75946	0.46371	0.74799	0.67666	0.73629	0.68941	0.72437	0.70195	0.71223	25
36	0.65077	0.75927	0.46393	0.74780	0.67688	0.73610	0.68962	0.72417	0.70215	0.71203	24
37	0.65100	0.75908	0.46414	0.74760	0.67709	0.73590	0.68983	0.72397	0.70236	0.71182	23
38	0.65122	0.75889	0.46436	0.74741	0.67730	0.73570	0.69004	0.72377	0.70257	0.71162	22
39	0.65144	0.75870	0.46458	0.74722	0.67752	0.73551	0.69025	0.72357	0.70277	0.71141	21
40	0.65166	0.75851	0.46480	0.74703	0.67773	0.73531	0.69046	0.72337	0.70298	0.71121	20
41	0.65188	0.75832	0.46501	0.74683	0.67795	0.73511	0.69067	0.72317	0.70319	0.71100	19
42	0.65210	0.75813	0.46523	0.74664	0.67816	0.73491	0.69088	0.72297	0.70339	0.71080	18
43	0.65232	0.75794	0.46545	0.74644	0.67837	0.73472	0.69109	0.72277	0.70360	0.71059	17
44	0.65254	0.75775	0.46566	0.74625	0.67859	0.73452	0.69130	0.72257	0.70381	0.71039	16
45	0.65276	0.75756	0.46588	0.74606	0.67880	0.73432	0.69151	0.72236	0.70401	0.71019	15
46	0.65298	0.75738	0.46610	0.74586	0.67901	0.73413	0.69172	0.72216	0.70422	0.70998	14
47	0.65320	0.75719	0.46632	0.74567	0.67923	0.73393	0.69193	0.72196	0.70443	0.70978	13
48	0.65342	0.75700	0.46653	0.74548	0.67944	0.73373	0.69214	0.72176	0.70463	0.70957	12
49	0.65364	0.75680	0.46675	0.74528	0.67965	0.73353	0.69235	0.72156	0.70484	0.70937	11
50	0.65386	0.75661	0.46697	0.74509	0.67987	0.73333	0.69256	0.72136	0.70505	0.70916	10
51	0.65408	0.75642	0.46718	0.74489	0.68008	0.73314	0.69277	0.72116	0.70525	0.70896	9
52	0.65430	0.75623	0.46740	0.74470	0.68029	0.73294	0.69298	0.72095	0.70546	0.70875	8
53	0.65452	0.75604	0.46762	0.74451	0.68051	0.73274	0.69319	0.72075	0.70567	0.70855	7
54	0.65474	0.75585	0.46783	0.74431	0.68072	0.73254	0.69340	0.72055	0.70587	0.70834	6
55	0.65496	0.75566	0.46805	0.74412	0.68093	0.73234	0.69361	0.72035	0.70608	0.70813	5
56	0.65518	0.75547	0.46827	0.74392	0.68115	0.73215	0.69382	0.72015	0.70628	0.70793	4
57	0.65540	0.75528	0.46848	0.74373	0.68136	0.73195	0.69403	0.71995	0.70649	0.70772	3
58	0.65562	0.75509	0.46870	0.74353	0.68157	0.73175	0.69424	0.71974	0.70670	0.70752	2
59	0.65584	0.75490	0.46891	0.74334	0.68179	0.73155	0.69445	0.71954	0.70690	0.70731	1
60	0.65606	0.75471	0.46913	0.74314	0.68200	0.73135	0.69466	0.71934	0.70711	0.70711	0

Table AII-2.—Natural Tangents and Cotangents

M	0°	1°	2°	3°	4°						
N	TAN	COT									
0	0000000	0000000	0.01746	57.2900	0.03492	28.6363	0.05241	19.0811	0.06993	14.3007	60
1	0.00029	3437.75	0.01775	56.3506	0.03521	28.3994	0.05270	18.9755	0.07022	14.2411	59
2	0.00058	1718.87	0.01804	55.4415	0.03550	28.1664	0.05329	18.8711	0.07051	14.1821	58
3	0.00087	1145.92	0.01833	54.5613	0.03579	27.9372	0.05328	18.7478	0.07080	14.1235	57
4	0.00116	859.434	0.01862	53.7086	0.03609	27.7117	0.05357	18.6456	0.07110	14.0655	56
5	0.00145	687.549	0.01891	52.8821	0.03638	27.4899	0.05387	18.5445	0.07139	14.0079	55
6	0.00175	572.957	0.01920	52.0807	0.03667	27.2715	0.05416	18.4645	0.07168	13.9507	54
7	0.00204	491.106	0.01949	51.3032	0.03696	27.0566	0.05445	18.3655	0.07197	13.8940	53
8	0.00233	429.718	0.01978	50.5485	0.03725	26.8450	0.05474	18.2677	0.07227	13.8378	52
9	0.00262	381.971	0.02007	49.8157	0.03754	26.6367	0.05503	18.1708	0.07256	13.7821	51
10	0.00291	343.774	0.02036	49.1039	0.03783	26.4316	0.05533	18.0750	0.07285	13.7267	50
11	0.00320	312.521	0.02066	48.4121	0.03812	26.2296	0.05562	17.9802	0.07314	13.6719	49
12	0.00349	286.478	0.02095	47.7393	0.03842	26.0307	0.05591	17.8863	0.07344	13.6174	48
13	0.00378	264.441	0.02124	47.0853	0.03871	25.8348	0.05620	17.7934	0.07373	13.5634	47
14	0.00407	245.352	0.02153	46.4489	0.03900	25.6418	0.05649	17.7015	0.07402	13.5098	46
15	0.00436	229.182	0.02182	45.8294	0.03929	25.4517	0.05678	17.6104	0.07431	13.4566	45
16	0.00465	214.858	0.02211	45.2261	0.03958	25.2644	0.05708	17.5205	0.07461	13.4039	44
17	0.00495	202.219	0.02240	44.6386	0.03987	25.0798	0.05737	17.4314	0.07490	13.3515	43
18	0.00524	190.984	0.02269	44.0661	0.04016	24.8978	0.05766	17.3432	0.07519	13.2996	42
19	0.00553	180.932	0.02298	43.5081	0.04046	24.7185	0.05795	17.2358	0.07548	13.2480	41
20	0.00582	171.885	0.02328	42.9641	0.04075	24.5418	0.05824	17.1693	0.07578	13.1969	40
21	0.00611	163.700	0.02357	42.4335	0.04104	24.3675	0.05854	17.0837	0.07607	13.1461	39
22	0.00640	156.259	0.02386	41.9158	0.04133	24.1957	0.05883	16.9990	0.07636	13.0958	38
23	0.00669	149.465	0.02415	41.4106	0.04162	24.0263	0.05912	16.9150	0.07665	13.0458	37
24	0.00698	143.237	0.02444	40.9174	0.04191	23.8593	0.05941	16.8319	0.07695	12.9962	36
25	0.00727	137.507	0.02473	40.4358	0.04220	23.6945	0.05970	16.7496	0.07724	12.9469	35
26	0.00756	132.219	0.02502	39.9635	0.04250	23.5321	0.05999	16.6481	0.07753	12.8981	34
27	0.00785	127.321	0.02531	39.5059	0.04279	23.3718	0.06029	16.5874	0.07782	12.8496	33
28	0.00815	122.774	0.02560	39.0568	0.04308	23.2137	0.06058	16.5075	0.07812	12.8014	32
29	0.00844	118.540	0.02589	38.6177	0.04337	23.0577	0.06087	16.4283	0.07841	12.7534	31
30	0.00873	114.589	0.02619	38.1885	0.04366	22.9038	0.06116	16.3499	0.07870	12.7062	30
31	0.00902	110.892	0.02648	37.7686	0.04395	22.7519	0.06145	16.2722	0.07899	12.6591	29
32	0.00931	107.426	0.02677	37.3579	0.04424	22.6020	0.06175	16.1952	0.07929	12.6124	28
33	0.00960	104.171	0.02706	36.9560	0.04454	22.4541	0.06204	16.1190	0.07958	12.5660	27
34	0.00989	101.107	0.02735	36.5627	0.04483	22.3081	0.06233	16.0435	0.07987	12.5199	26
35	0.01018	98.2179	0.02764	36.1776	0.04512	22.1640	0.06262	15.9687	0.08017	12.4742	25
36	0.01047	95.4895	0.02793	35.8006	0.04541	22.0217	0.06291	15.8945	0.08046	12.4288	24
37	0.01076	92.9085	0.02822	35.4313	0.04570	21.8813	0.06321	15.8211	0.08075	12.3838	23
38	0.01105	90.4633	0.02851	35.0695	0.04599	21.7426	0.06350	15.7483	0.08104	12.3390	22
39	0.01135	88.1436	0.02881	34.7151	0.04628	21.6056	0.06379	15.6762	0.08134	12.2946	21
40	0.01164	85.9398	0.02910	34.3678	0.04658	21.4704	0.06408	15.6048	0.08163	12.2505	20
41	0.01193	83.8435	0.02939	34.0273	0.04687	21.3369	0.06438	15.5340	0.08192	12.2067	19
42	0.01222	81.8470	0.02968	33.6935	0.04716	21.2049	0.06467	15.4638	0.08221	12.1632	18
43	0.01251	79.9434	0.02997	33.3662	0.04745	21.0747	0.06496	15.3943	0.08251	12.1201	17
44	0.01280	78.1263	0.03026	33.0452	0.04774	20.9460	0.06525	15.3254	0.08280	12.0772	16
45	0.01309	76.3900	0.03055	32.7303	0.04803	20.8188	0.06554	15.2371	0.08309	12.0346	15
46	0.01338	74.7292	0.03084	32.4213	0.04833	20.6932	0.06584	15.1893	0.08339	11.9923	14
47	0.01367	73.1390	0.03114	32.1181	0.04862	20.5691	0.06613	15.1222	0.08368	11.9504	13
48	0.01396	71.6151	0.03143	31.8205	0.04891	20.4465	0.06642	15.0537	0.08397	11.9087	12
49	0.01425	70.1533	0.03172	31.5284	0.04920	20.3253	0.06671	14.9898	0.08427	11.8673	11
50	0.01455	68.7501	0.03201	31.2416	0.04949	20.2056	0.06700	14.9244	0.08456	11.8262	10
51	0.01484	67.4019	0.03230	30.9599	0.04978	20.0872	0.06730	14.8596	0.08485	11.7853	9
52	0.01513	66.1055	0.03259	30.6833	0.05007	19.9702	0.06759	14.7954	0.08514	11.7448	8
53	0.01542	64.8580	0.03288	30.4116	0.05037	19.8546	0.06788	14.7317	0.08544	11.7045	7
54	0.01571	63.6367	0.03317	30.1446	0.05066	19.7403	0.06817	14.6685	0.08573	11.6645	6
55	0.01600	62.4992	0.03346	29.8823	0.05095	19.6273	0.06847	14.6059	0.08602	11.6248	5
56	0.01629	61.3829	0.03376	29.6245	0.05124	19.5156	0.06876	14.5438	0.08632	11.5853	4
57	0.01658	60.3058	0.03405	29.3711	0.05153	19.4051	0.06905	14.4823	0.08661	11.5461	3
58	0.01687	59.2659	0.03434	29.1220	0.05182	19.2959	0.06934	14.4212	0.08690	11.5072	2
59	0.01716	58.2612	0.03463	28.8771	0.05212	19.1879	0.06963	14.3607	0.08720	11.4685	1
60	0.01745	57.2900	0.03492	28.6363	0.05241	19.0811	0.06993	14.3007	0.08749	11.4301	0

COT	TAN	M								
89°	88°	87°	86°	85°	84°	83°	82°	81°	80°	I
89°	88°	87°	86°	85°	84°	83°	82°	81°	80°	N

Table AII-2.—Natural Tangents and Cotangents—Continued

M	5°	6°	7°	8°	9°						
I	TAN	COT	M								
0	0.08749	11.4301	0.10510	9.51436	0.12278	8.14435	0.14054	7.11537	0.15838	6.31375	60
1	0.08778	11.3919	0.10540	9.48781	0.12308	8.12481	0.14084	7.10038	0.15868	6.30189	59
2	0.08807	11.3540	0.10569	9.46141	0.12338	8.10536	0.14113	7.08546	0.15898	6.29007	58
3	0.08837	11.3163	0.10599	9.43515	0.12367	8.08600	0.14143	7.07059	0.15928	6.27829	57
4	0.08866	11.2789	0.10628	9.40904	0.12397	8.06674	0.14173	7.05579	0.15958	6.26655	56
5	0.08895	11.2417	0.10657	9.38307	0.12426	8.04756	0.14202	7.04105	0.15988	6.25484	55
6	0.08925	11.2048	0.10687	9.35724	0.12456	8.02848	0.14232	7.02637	0.16017	6.24321	54
7	0.08954	11.1681	0.10716	9.33155	0.12485	8.00948	0.14262	7.01174	0.16047	6.23160	53
8	0.08983	11.1316	0.10746	9.30599	0.12515	7.99058	0.14291	6.99718	0.16077	6.22003	52
9	0.09013	11.0954	0.10775	9.28058	0.12544	7.97176	0.14321	6.98268	0.16107	6.20851	51
10	0.09042	11.0594	0.10805	9.25530	0.12574	7.95302	0.14351	6.96823	0.16137	6.19703	50
11	0.09071	11.0237	0.10834	9.23016	0.12603	7.93438	0.14381	6.95385	0.16167	6.18359	49
12	0.09101	10.9882	0.10863	9.20516	0.12633	7.91582	0.14410	6.93952	0.16196	6.17419	48
13	0.09130	10.9529	0.10893	9.18028	0.12662	7.89734	0.14440	6.92523	0.16226	6.16283	47
14	0.09159	10.9178	0.10922	9.15554	0.12692	7.87895	0.14470	6.91104	0.16256	6.15151	46
15	0.09189	10.8829	0.10952	9.13093	0.12722	7.86064	0.14499	6.89688	0.16286	6.14023	45
16	0.09218	10.8483	0.10981	9.10646	0.12751	7.84242	0.14529	6.88278	0.16316	6.12899	44
17	0.09247	10.8139	0.11011	9.08211	0.12781	7.82428	0.14559	6.86874	0.16346	6.11779	43
18	0.09277	10.7797	0.11040	9.05789	0.12810	7.80622	0.14588	6.85475	0.16376	6.10664	42
19	0.09306	10.7457	0.11070	9.03379	0.12840	7.78825	0.14618	6.84082	0.16405	6.09552	41
20	0.09335	10.7119	0.11099	9.00983	0.12869	7.77035	0.14648	6.82694	0.16435	6.08444	40
21	0.09365	10.6783	0.11128	8.98598	0.12899	7.75254	0.14678	6.81312	0.16465	6.07340	39
22	0.09394	10.6450	0.11158	8.96227	0.12929	7.73480	0.14707	6.79936	0.16495	6.06240	38
23	0.09423	10.6118	0.11187	8.93867	0.12958	7.71715	0.14737	6.78564	0.16525	6.05143	37
24	0.09453	10.5789	0.11217	8.91520	0.12988	7.69957	0.14767	6.77199	0.16555	6.04051	36
25	0.09482	10.5462	0.11246	8.89185	0.13017	7.68208	0.14796	6.75388	0.16585	6.02962	35
26	0.09511	10.5136	0.11276	8.86862	0.13047	7.66466	0.14826	6.74483	0.16615	6.01878	34
27	0.09541	10.4813	0.11305	8.84551	0.13076	7.64732	0.14856	6.73133	0.16645	6.00797	33
28	0.09570	10.4491	0.11335	8.82252	0.13106	7.63005	0.14886	6.71789	0.16674	5.99720	32
29	0.09600	10.4172	0.11364	8.79964	0.13136	7.61287	0.14915	6.70450	0.16704	5.98646	31
30	0.09629	10.3854	0.11394	8.77689	0.13165	7.59575	0.14945	6.69116	0.16734	5.97576	30
31	0.09658	10.3538	0.11423	8.75425	0.13195	7.57872	0.14975	6.67787	0.16764	5.96510	29
32	0.09688	10.3224	0.11452	8.73172	0.13224	7.56176	0.15005	6.66463	0.16794	5.95448	28
33	0.09717	10.2913	0.11482	8.70931	0.13254	7.54487	0.15034	6.65144	0.16824	5.94390	27
34	0.09746	10.2602	0.11511	8.68701	0.13284	7.52806	0.15064	6.63831	0.16854	5.93335	26
35	0.09776	10.2294	0.11541	8.66482	0.13313	7.51132	0.15094	6.62523	0.16884	5.92283	25
36	0.09805	10.1988	0.11570	8.64275	0.13343	7.49465	0.15124	6.61219	0.16914	5.91236	24
37	0.09834	10.1683	0.11600	8.62078	0.13372	7.47806	0.15153	6.59921	0.16944	5.90191	23
38	0.09864	10.1381	0.11629	8.59893	0.13402	7.46154	0.15183	6.58627	0.16974	5.89151	22
39	0.09893	10.1080	0.11659	8.57718	0.13432	7.44509	0.15213	6.57339	0.17004	5.88114	21
40	0.09923	10.0780	0.11688	8.55555	0.13461	7.42871	0.15243	6.56055	0.17033	5.87080	20
41	0.09952	10.0483	0.11718	8.53402	0.13491	7.41240	0.15272	6.54777	0.17063	5.86051	19
42	0.09981	10.0187	0.11747	8.51259	0.13521	7.39616	0.15302	6.53503	0.17093	5.85024	18
43	0.10011	9.98931	0.11777	8.49128	0.13550	7.37999	0.15332	6.52234	0.17123	5.84001	17
44	0.10040	9.96007	0.11806	8.47007	0.13580	7.36389	0.15362	6.50970	0.17153	5.82982	16
45	0.10069	9.93101	0.11834	8.44896	0.13609	7.34786	0.15391	6.49710	0.17183	5.81966	15
46	0.10099	9.90211	0.11865	8.42795	0.13639	7.33190	0.15421	6.48456	0.17213	5.80953	14
47	0.10128	9.87338	0.11895	8.40705	0.13669	7.31600	0.15451	6.47206	0.17243	5.79944	13
48	0.10158	9.84482	0.11924	8.38625	0.13698	7.30018	0.15481	6.45961	0.17273	5.78938	12
49	0.10187	9.81641	0.11954	8.36555	0.13728	7.28442	0.15511	6.44720	0.17303	5.77936	11
50	0.10216	9.78817	0.11983	8.34496	0.13758	7.26873	0.15540	6.43484	0.17333	5.76937	10
51	0.10246	9.76009	0.12013	8.32446	0.13787	7.25310	0.15570	6.42253	0.17363	5.75941	9
52	0.10275	9.73217	0.12042	8.30406	0.13817	7.23754	0.15600	6.41026	0.17393	5.74949	8.
53	0.10305	9.70441	0.12072	8.28376	0.13846	7.22204	0.15630	6.39804	0.17423	5.73960	7
54	0.10334	9.67680	0.12101	8.26355	0.13876	7.20661	0.15660	6.38587	0.17453	5.72974	6
55	0.10363	9.64935	0.12131	8.24345	0.13906	7.19125	0.15689	6.37374	0.17483	5.71992	5
56	0.10393	9.62205	0.12160	8.22344	0.13935	7.17594	0.15719	6.36165	0.17513	5.71013	4
57	0.10422	9.59490	0.12190	8.20352	0.13965	7.16071	0.15749	6.34961	0.17543	5.70037	3
58	0.10452	9.56791	0.12219	8.18370	0.13995	7.14553	0.15779	6.33761	0.17573	5.69064	2
59	0.10481	9.54106	0.12249	8.16398	0.14024	7.13042	0.15809	6.32566	0.17603	5.68094	1
60	0.10510	9.51436	0.12278	8.14435	0.14054	7.11537	0.15838	6.31375	0.17633	5.67128	0

Table AII-2.—Natural Tangents and Cotangents—Continued

M	10°	11°	12°	13°	14°							
I	N	TAN	COT	M								
0	0.17633	5.67128	0.19438	5.14455	0.21256	4.70463	0.23087	4.33148	0.24933	4.01078	0.26793	60
1	0.17663	5.66165	0.19468	5.13658	0.21286	4.69791	0.23117	4.32573	0.24964	4.00582	0.26793	59
2	0.17693	5.65205	0.19498	5.12862	0.21316	4.69121	0.23148	4.32001	0.24995	4.00086	0.26793	58
3	0.17723	5.64248	0.19529	5.12069	0.21347	4.68452	0.23179	4.31430	0.25026	3.99592	0.26793	57
4	0.17753	5.63295	0.19559	5.11279	0.21377	4.67786	0.23209	4.30860	0.25056	3.99099	0.26793	56
5	0.17783	5.62344	0.19589	5.10490	0.21408	4.67121	0.23240	4.30291	0.25087	3.98607	0.26793	55
6	0.17813	5.61397	0.19619	5.09704	0.21438	4.66458	0.23271	4.29724	0.25118	3.98117	0.26793	54
7	0.17843	5.60452	0.19649	5.08921	0.21469	4.65797	0.23301	4.29159	0.25149	3.97627	0.26793	53
8	0.17873	5.59511	0.19680	5.08139	0.21499	4.65138	0.23332	4.28595	0.25180	3.97139	0.26793	52
9	0.17903	5.58573	0.19710	5.07360	0.21529	4.64480	0.23363	4.28032	0.25211	3.96651	0.26793	51
10	0.17933	5.57638	0.19740	5.06584	0.21560	4.63825	0.23393	4.27471	0.25242	3.96163	0.26793	50
11	0.17963	5.56706	0.19770	5.05809	0.21590	4.63171	0.23424	4.26911	0.25273	3.95680	0.26793	49
12	0.17993	5.55777	0.19801	5.05037	0.21621	4.62518	0.23455	4.26332	0.25304	3.95196	0.26793	48
13	0.18023	5.54851	0.19831	5.04267	0.21651	4.61868	0.23485	4.25795	0.25335	3.94713	0.26793	47
14	0.18053	5.53927	0.19861	5.03499	0.21682	4.61219	0.23516	4.25239	0.25366	3.94232	0.26793	46
15	0.18083	5.53007	0.19891	5.02734	0.21712	4.60572	0.23547	4.24685	0.25397	3.93751	0.26793	45
16	0.18113	5.52090	0.19921	5.01971	0.21743	4.59927	0.23578	4.24132	0.25428	3.93271	0.26793	44
17	0.18143	5.51176	0.19952	5.01210	0.21773	4.59283	0.23608	4.23580	0.25459	3.92793	0.26793	43
18	0.18173	5.50264	0.19982	5.00451	0.21804	4.58641	0.23639	4.23030	0.25490	3.92316	0.26793	42
19	0.18203	5.49356	0.20012	4.99695	0.21834	4.58001	0.23670	4.22481	0.25521	3.91839	0.26793	41
20	0.18233	5.48451	0.20042	4.98940	0.21864	4.57363	0.23700	4.21933	0.25552	3.91364	0.26793	40
21	0.18263	5.47548	0.20073	4.98188	0.21895	4.56726	0.23731	4.21387	0.25583	3.90890	0.26793	39
22	0.18293	5.46648	0.20103	4.97438	0.21925	4.56091	0.23762	4.20842	0.25614	3.90417	0.26793	38
23	0.18323	5.45751	0.20133	4.96690	0.21956	4.55458	0.23793	4.20298	0.25645	3.89945	0.26793	37
24	0.18353	5.44857	0.20164	4.95945	0.21986	4.54826	0.23823	4.19756	0.25676	3.89474	0.26793	36
25	0.18384	5.43966	0.20194	4.95201	0.22017	4.54196	0.23854	4.19215	0.25707	3.89004	0.26793	35
26	0.18414	5.43077	0.20224	4.94460	0.22047	4.53568	0.23885	4.18673	0.25738	3.88536	0.26793	34
27	0.18444	5.42192	0.20254	4.93721	0.22078	4.52941	0.23916	4.18137	0.25769	3.88068	0.26793	33
28	0.18474	5.41309	0.20285	4.92984	0.22108	4.52316	0.23946	4.17600	0.25800	3.87601	0.26793	32
29	0.18504	5.40429	0.20315	4.92249	0.22139	4.51693	0.23977	4.17064	0.25831	3.87136	0.26793	31
30	0.18534	5.39532	0.20345	4.91516	0.22169	4.51071	0.24008	4.16530	0.25862	3.86671	0.26793	30
31	0.18564	5.38677	0.20376	4.90785	0.22200	4.50451	0.24039	4.15997	0.25893	3.86208	0.26793	29
32	0.18594	5.37805	0.20406	4.90056	0.22231	4.49832	0.24069	4.15445	0.25924	3.85745	0.26793	28
33	0.18624	5.36936	0.20436	4.89330	0.22261	4.49215	0.24100	4.14934	0.25955	3.85284	0.26793	27
34	0.18654	5.36070	0.20466	4.88605	0.22292	4.48600	0.24131	4.14405	0.25986	3.84824	0.26793	26
35	0.18684	5.35206	0.20497	4.87882	0.22322	4.47986	0.24162	4.13877	0.26017	3.84364	0.26793	25
36	0.18714	5.34345	0.20527	4.87162	0.22353	4.47374	0.24193	4.13350	0.26048	3.83906	0.26793	24
37	0.18745	5.33487	0.20557	4.86444	0.22383	4.46764	0.24223	4.12823	0.26079	3.83449	0.26793	23
38	0.18775	5.32631	0.20588	4.85727	0.22414	4.46155	0.24254	4.12301	0.26110	3.82992	0.26793	22
39	0.18805	5.31778	0.20618	4.85013	0.22444	4.45548	0.24285	4.11778	0.26141	3.82537	0.26793	21
40	0.18835	5.30928	0.20648	4.84300	0.22475	4.44942	0.24316	4.11256	0.26172	3.82083	0.26793	20
41	0.18865	5.30080	0.20679	4.83590	0.22505	4.44338	0.24347	4.10736	0.26203	3.81630	0.26793	19
42	0.18895	5.29235	0.20709	4.82882	0.22536	4.43735	0.24377	4.10216	0.26235	3.81177	0.26793	18
43	0.18925	5.28393	0.20739	4.82175	0.22567	4.43134	0.24408	4.09699	0.26266	3.80726	0.26793	17
44	0.18955	5.27553	0.20770	4.81471	0.22597	4.42534	0.24439	4.09182	0.26297	3.80276	0.26793	16
45	0.18986	5.26715	0.20800	4.80769	0.22628	4.41936	0.24470	4.08666	0.26328	3.79827	0.26793	15
46	0.19016	5.25880	0.20830	4.80068	0.22658	4.41340	0.24501	4.08152	0.26359	3.79378	0.26793	14
47	0.19046	5.25048	0.20861	4.79370	0.22689	4.40743	0.24532	4.07639	0.26390	3.78931	0.26793	13
48	0.19076	5.24218	0.20891	4.78673	0.22719	4.40152	0.24562	4.07127	0.26421	3.78485	0.26793	12
49	0.19106	5.23391	0.20921	4.77978	0.22750	4.39560	0.24593	4.06616	0.26452	3.78040	0.26793	11
50	0.19136	5.22566	0.20952	4.77286	0.22781	4.38969	0.24624	4.06107	0.26483	3.77595	0.26793	10
51	0.19166	5.21744	0.20982	4.76595	0.22811	4.38381	0.24655	4.05599	0.26515	3.77152	0.26793	9
52	0.19197	5.20925	0.21013	4.75906	0.22842	4.37793	0.24686	4.05092	0.26546	3.76709	0.26793	8
53	0.19227	5.20107	0.21043	4.75219	0.22872	4.37207	0.24717	4.04586	0.26577	3.76268	0.26793	7
54	0.19257	5.19293	0.21073	4.74534	0.22903	4.36623	0.24747	4.04081	0.26608	3.75828	0.26793	6
55	0.19287	5.18480	0.21104	4.73851	0.22934	4.36040	0.24778	4.03578	0.26639	3.75388	0.26793	5
56	0.19317	5.17671	0.21134	4.73170	0.22964	4.35459	0.24809	4.03076	0.26670	3.74950	0.26793	4
57	0.19347	5.16863	0.21164	4.72490	0.22995	4.34879	0.24840	4.02574	0.26701	3.74512	0.26793	3
58	0.19378	5.16058	0.21195	4.71813	0.23026	4.34300	0.24871	4.02074	0.26733	3.74075	0.26793	2
59	0.19408	5.15256	0.21225	4.71137	0.23056	4.33723	0.24902	4.01576	0.26764	3.73640	0.26793	1
60	0.19438	5.14455	0.21256	4.70463	0.23087	4.33148	0.24933	4.01078	0.26793	3.73205	0.26793	0

COT TAN COT TAN COT TAN COT TAN COT TAN M
79° 78° 77° 76° 75° N

Table AII-2.—Natural Tangents and Cotangents—Continued

M	15°	16°	17°	18°	19°							
I	N	TAN	COT	M								
0	0.26795	3.73205	0.28675	3.48741	0.30573	3.27085	0.32492	3.07768	0.34433	2.90421	0.34465	60
1	0.26826	3.72771	0.28706	3.48359	0.30605	3.26745	0.32524	3.07464	0.34465	2.90147	0.34498	59
2	0.26857	3.72338	0.28738	3.47977	0.30637	3.26406	0.32556	3.07160	0.34498	2.89873	0.34530	58
3	0.26888	3.71907	0.28769	3.47596	0.30669	3.26067	0.32588	3.06857	0.34530	2.89600	0.34554	57
4	0.26920	3.71476	0.28801	3.47216	0.30700	3.25729	0.32621	3.06554	0.34563	2.89327	0.34596	56
5	0.26951	3.71046	0.28832	3.46837	0.30732	3.25392	0.32653	3.06252	0.34596	2.89055	0.34628	55
6	0.26982	3.70616	0.28864	3.46458	0.30764	3.25055	0.32685	3.05950	0.34628	2.88783	0.34661	54
7	0.27013	3.70188	0.28895	3.46080	0.30796	3.24719	0.32717	3.05649	0.34661	2.88511	0.34693	53
8	0.27044	3.69761	0.28927	3.45703	0.30828	3.24383	0.32749	3.05349	0.34693	2.88240	0.34726	52
9	0.27076	3.69335	0.28958	3.45327	0.30860	3.24049	0.32782	3.05049	0.34726	2.87970	0.34758	51
10	0.27107	3.68909	0.28990	3.44951	0.30891	3.23714	0.32814	3.04749	0.34758	2.87700	0.34791	50
11	0.27138	3.68485	0.29021	3.44576	0.30923	3.23381	0.32846	3.04450	0.34791	2.87430	0.34824	49
12	0.27169	3.68061	0.29053	3.44202	0.30955	3.23048	0.32878	3.04152	0.34824	2.87161	0.34856	48
13	0.27201	3.67638	0.29084	3.43829	0.30987	3.22715	0.32911	3.03854	0.34856	2.86892	0.34889	47
14	0.27232	3.67217	0.29116	3.43456	0.31019	3.22384	0.32943	3.03556	0.34889	2.86624	0.34922	46
15	0.27263	3.66796	0.29147	3.43084	0.31051	3.22053	0.32975	3.03240	0.34922	2.86356	0.34954	45
16	0.27294	3.66376	0.29179	3.42713	0.31083	3.21722	0.33007	3.02963	0.34954	2.86089	0.34987	44
17	0.27326	3.65957	0.29210	3.42343	0.31115	3.21392	0.33040	3.02667	0.34987	2.85822	0.35020	43
18	0.27357	3.65538	0.29242	3.41973	0.31147	3.21063	0.33072	3.02372	0.35020	2.85555	0.35052	42
19	0.27388	3.65121	0.29274	3.41604	0.31178	3.20734	0.33104	3.02077	0.35052	2.85289	0.35085	41
20	0.27419	3.64705	0.29305	3.41236	0.31210	3.20406	0.33136	3.01783	0.35085	2.85023	0.35118	40
21	0.27451	3.64289	0.29337	3.40869	0.31242	3.20079	0.33169	3.01489	0.35118	2.84758	0.35150	39
22	0.27482	3.63874	0.29368	3.40502	0.31274	3.19752	0.33201	3.01196	0.35150	2.84494	0.35183	38
23	0.27513	3.63461	0.29400	3.40136	0.31306	3.19426	0.33233	3.00903	0.35183	2.84229	0.35216	37
24	0.27545	3.63048	0.29432	3.39771	0.31338	3.19100	0.33266	3.00611	0.35216	2.83965	0.35248	36
25	0.27576	3.62636	0.29463	3.39406	0.31370	3.18775	0.33298	3.00319	0.35248	2.83702	0.35320	35
26	0.27607	3.62224	0.29495	3.39042	0.31402	3.18451	0.33330	3.00028	0.35281	2.83439	0.35352	34
27	0.27638	3.61814	0.29526	3.38679	0.31434	3.18127	0.33363	2.99738	0.35314	2.83176	0.35395	33
28	0.27670	3.61405	0.29558	3.38317	0.31466	3.17804	0.33395	2.99447	0.35346	2.82914	0.35427	32
29	0.27701	3.60996	0.29590	3.37955	0.31498	3.17481	0.33427	2.99158	0.35379	2.82653	0.35453	31
30	0.27732	3.60588	0.29621	3.37594	0.31530	3.17159	0.33460	2.98868	0.35412	2.82391	0.35484	30
31	0.27764	3.60181	0.29653	3.37234	0.31562	3.16838	0.33492	2.98580	0.35445	2.82130	0.35518	29
32	0.27795	3.59775	0.29685	3.36875	0.31594	3.16517	0.33524	2.98292	0.35477	2.81870	0.35559	28
33	0.27826	3.59370	0.29716	3.36516	0.31626	3.16197	0.33557	2.98004	0.35510	2.81610	0.35591	27
34	0.27858	3.58966	0.29748	3.36158	0.31658	3.15877	0.33589	2.97717	0.35543	2.81350	0.35614	26
35	0.27889	3.58562	0.29780	3.35800	0.31690	3.15558	0.33621	2.97430	0.35576	2.81091	0.35634	25
36	0.27921	3.58160	0.29811	3.35443	0.31722	3.15240	0.33654	2.97144	0.35608	2.80833	0.35684	24
37	0.27952	3.57758	0.29843	3.35087	0.31754	3.14922	0.33686	2.96858	0.35641	2.80574	0.35715	23
38	0.27983	3.57357	0.29875	3.34732	0.31786	3.14605	0.33718	2.96573	0.35674	2.80316	0.35747	22
39	0.28015	3.56957	0.29906	3.34377	0.31818	3.14288	0.33751	2.96288	0.35707	2.80059	0.35778	21
40	0.28046	3.56557	0.29938	3.34023	0.31850	3.13972	0.33783	2.96004	0.35740	2.79802	0.35814	20
41	0.28077	3.56159	0.29970	3.33670	0.31882	3.13656	0.33816	2.95721	0.35772	2.79545	0.35845	19
42	0.28109	3.55761	0.30001	3.33317	0.31914	3.13341	0.33848	2.95437	0.35805	2.79289	0.35876	18
43	0.28140	3.55364	0.30033	3.32965	0.31946	3.13027	0.33881	2.95155	0.35838	2.79033	0.35907	17
44	0.28172	3.54968	0.30065	3.32614	0.31978	3.12713	0.33913	2.94872	0.35871	2.78778	0.35938	16
45	0.28203	3.54573	0.30097	3.32264	0.32010	3.12400	0.33945	2.94591	0.35904	2.78523	0.35977	15
46	0.28234	3.54179	0.30128	3.31914	0.32042	3.12087	0.33978	2.94309	0.35937	2.78269	0.36016	14
47	0.28266	3.53785	0.30160	3.31565	0.32074	3.11775	0.34010	2.94028	0.35969	2.78014	0.36054	13
48	0.28297	3.53393	0.30192	3.31216	0.32106	3.11464	0.34043	2.93748	0.36002	2.77761	0.36083	12
49	0.28329	3.53001	0.30224	3.30868	0.32139	3.11153	0.34075	2.93468	0.36035	2.77507	0.36114	11
50	0.28360	3.52609	0.30255	3.30521	0.32171	3.10842	0.34108	2.93189	0.36068	2.77254	0.36146	10
51	0.28391	3.52219	0.30287	3.30174	0.32203	3.10532	0.34146	2.92910	0.36101	2.77002	0.36178	9
52	0.28423	3.51829	0.30319	3.29829	0.32235	3.10223	0.34173	2.92632	0.36134	2.76750	0.36205	8
53	0.28454	3.51441	0.30351	3.29483	0.32267	3.09914	0.34205	2.92354	0.36167	2.76498	0.36232	7
54	0.28486	3.51053	0.30382	3.29139	0.32299	3.09606	0.34238	2.92076	0.36199	2.76247	0.36260	6
55	0.28517	3.50666	0.30414	3.28795	0.32331	3.09298	0.34270	2.91799	0.36232	2.75996	0.36287	5
56	0.28549	3.50279	0.30446	3.28452	0.32363	3.08991	0.34303	2.91523	0.36265	2.75746	0.36314	4
57	0.28580	3.49894	0.30478	3.28109	0.32396	3.08685	0.34335	2.91246	0.36298	2.75496	0.36341	3
58	0.28612	3.49509	0.30509	3.27767	0.32428	3.08379	0.34368	2.90971	0.36331	2.75246	0.36364	2
59	0.28643	3.49125	0.30541	3.27426	0.32460	3.08073	0.34400	2.90696	0.36331	2.74997	0.36397	1
60	0.28675	3.48741	0.30573	3.27085	0.32492	3.07768	0.34433	2.90421	0.36397	2.74748	0.36433	0

COT TAN COT TAN COT TAN COT TAN COT TAN M
 74° 73° 72° 71° 70° N

Table AII-2.—Natural Tangents and Cotangents—Continued

M	20°	21°	22°	23°	24°						
I	TAN	COT	TAN	COT	TAN						
0	0.36397	2.74748	0.38386	2.60509	0.40403	2.47509	0.42447	2.35585	0.44523	2.24604	60
1	0.36430	2.74499	0.38420	2.60283	0.40436	2.47302	0.42482	2.35395	0.44558	2.24428	59
2	0.36463	2.74251	0.38453	2.60057	0.40470	2.47095	0.42516	2.35205	0.44593	2.24232	58
3	0.36496	2.74004	0.38487	2.59831	0.40504	2.46888	0.42551	2.35015	0.44627	2.24077	57
4	0.36529	2.73756	0.38520	2.59606	0.40538	2.46682	0.42585	2.34825	0.44662	2.23902	56
5	0.36562	2.73509	0.38553	2.59381	0.40572	2.46476	0.42619	2.34636	0.44697	2.23727	55
6	0.36595	2.73263	0.38587	2.59156	0.40606	2.46270	0.42654	2.34447	0.44732	2.23553	54
7	0.36628	2.73017	0.38620	2.58932	0.40640	2.46065	0.42688	2.34258	0.44767	2.23378	53
8	0.36661	2.72771	0.38654	2.58708	0.40674	2.45860	0.42722	2.34069	0.44802	2.23204	52
9	0.36694	2.72526	0.38687	2.58484	0.40707	2.45653	0.42757	2.33881	0.44837	2.23030	51
10	0.36727	2.72281	0.38721	2.58261	0.40741	2.45451	0.42791	2.33693	0.44872	2.22857	50
11	0.36760	2.72036	0.38754	2.58038	0.40775	2.45246	0.42826	2.33505	0.44907	2.22683	49
12	0.36793	2.71792	0.38787	2.57815	0.40809	2.45043	0.42860	2.33317	0.44942	2.22510	48
13	0.36826	2.71548	0.38821	2.57593	0.40843	2.44839	0.42894	2.33130	0.44977	2.22337	47
14	0.36859	2.71305	0.38854	2.57371	0.40877	2.44636	0.42929	2.32943	0.45012	2.22164	46
15	0.36892	2.71062	0.38888	2.57150	0.40911	2.44433	0.42963	2.32756	0.45047	2.21992	45
16	0.36925	2.70819	0.38921	2.56928	0.40945	2.44230	0.42998	2.32570	0.45082	2.21819	44
17	0.36958	2.70577	0.38955	2.56707	0.40979	2.44027	0.43032	2.32383	0.45117	2.21647	43
18	0.36991	2.70335	0.38988	2.56487	0.41013	2.43825	0.43067	2.32197	0.45152	2.21475	42
19	0.37024	2.70094	0.39022	2.56266	0.41047	2.43623	0.43101	2.32012	0.45187	2.21304	41
20	0.37057	2.69853	0.39055	2.56046	0.41081	2.43422	0.43134	2.31826	0.45222	2.21132	40
21	0.37090	2.69612	0.39089	2.55827	0.41115	2.43220	0.43170	2.31641	0.45257	2.20961	39
22	0.37123	2.69371	0.39122	2.55608	0.41149	2.43019	0.43205	2.31456	0.45292	2.20790	38
23	0.37157	2.69131	0.39156	2.55389	0.41183	2.42819	0.43239	2.31271	0.45327	2.20619	37
24	0.37190	2.68892	0.39190	2.55170	0.41217	2.42618	0.43274	2.31086	0.45362	2.20449	36
25	0.37223	2.68653	0.39223	2.54952	0.41251	2.42418	0.43308	2.30902	0.45397	2.20278	35
26	0.37256	2.68414	0.39257	2.54734	0.41285	2.42218	0.43343	2.30718	0.45432	2.20108	34
27	0.37289	2.68175	0.39290	2.54516	0.41319	2.42019	0.43378	2.30534	0.45467	2.19938	33
28	0.37322	2.67937	0.39324	2.54299	0.41353	2.41819	0.43412	2.30351	0.45502	2.19769	32
29	0.37355	2.67700	0.39357	2.54082	0.41387	2.41620	0.43447	2.30167	0.45538	2.19599	31
30	0.37388	2.67462	0.39391	2.53865	0.41421	2.41421	0.43481	2.29984	0.45573	2.19430	30
31	0.37422	2.67223	0.39425	2.53648	0.41455	2.41223	0.43516	2.29801	0.45608	2.19241	29
32	0.37455	2.66989	0.39458	2.53432	0.41490	2.41025	0.43550	2.29619	0.45643	2.19092	28
33	0.37488	2.66752	0.39492	2.53217	0.41524	2.40827	0.43585	2.29437	0.45678	2.18923	27
34	0.37521	2.66516	0.39526	2.53001	0.41558	2.40629	0.43620	2.29254	0.45713	2.18735	26
35	0.37554	2.66281	0.39559	2.52786	0.41592	2.40432	0.43654	2.29073	0.45748	2.18587	25
36	0.37588	2.66046	0.39593	2.52571	0.41626	2.40235	0.43689	2.28891	0.45784	2.18419	24
37	0.37621	2.65811	0.39626	2.52357	0.41660	2.40038	0.43724	2.28710	0.45819	2.18231	23
38	0.37654	2.65576	0.39660	2.52142	0.41694	2.39841	0.43758	2.28528	0.45854	2.18084	22
39	0.37687	2.65342	0.39694	2.51929	0.41728	2.39645	0.43793	2.28348	0.45889	2.17916	21
40	0.37720	2.65109	0.39727	2.51715	0.41763	2.39449	0.43828	2.28167	0.45924	2.17749	20
41	0.37754	2.64875	0.39761	2.51502	0.41797	2.39253	0.43862	2.27987	0.45960	2.17582	19
42	0.37787	2.64642	0.39795	2.51289	0.41831	2.39058	0.43897	2.27806	0.45995	2.17416	18
43	0.37820	2.64410	0.39829	2.51076	0.41865	2.38863	0.43932	2.27626	0.46030	2.17249	17
44	0.37853	2.64177	0.39862	2.50864	0.41899	2.38668	0.43966	2.27447	0.46065	2.17083	16
45	0.37887	2.63945	0.39896	2.50652	0.41933	2.38473	0.44001	2.27267	0.46101	2.16917	15
46	0.37920	2.63714	0.39930	2.50440	0.41968	2.38279	0.44036	2.27088	0.46136	2.16751	14
47	0.37953	2.63483	0.39963	2.50229	0.42002	2.38084	0.44071	2.26909	0.46171	2.16585	13
48	0.37986	2.63252	0.39997	2.50018	0.42036	2.37891	0.44105	2.26730	0.46206	2.16420	12
49	0.38020	2.63021	0.40031	2.49807	0.42070	2.37697	0.44140	2.26552	0.46242	2.16255	11
50	0.38053	2.62791	0.40065	2.49597	0.42105	2.37504	0.44175	2.26374	0.46277	2.16090	10
51	0.38086	2.62561	0.40098	2.49386	0.42139	2.37311	0.44210	2.26196	0.46312	2.15923	9
52	0.38120	2.62332	0.40132	2.49177	0.42173	2.37118	0.44244	2.26018	0.46348	2.15760	8
53	0.38153	2.62103	0.40166	2.48967	0.42207	2.36925	0.44279	2.25840	0.46383	2.15596	7
54	0.38186	2.61874	0.40200	2.48758	0.42242	2.36733	0.44314	2.25663	0.46418	2.15432	6
55	0.38220	2.61646	0.40234	2.48549	0.42276	2.36541	0.44349	2.25486	0.46454	2.15268	5
56	0.38253	2.61418	0.40267	2.48340	0.42310	2.36349	0.44384	2.25309	0.46489	2.15104	4
57	0.38286	2.61190	0.40301	2.48132	0.42345	2.36158	0.44418	2.25132	0.46525	2.14940	3
58	0.38320	2.60963	0.40335	2.47924	0.42379	2.35967	0.44453	2.24934	0.46560	2.14777	2
59	0.38353	2.60736	0.40369	2.47716	0.42413	2.35776	0.44488	2.24780	0.46595	2.14614	1
60	0.38386	2.60509	0.40403	2.47509	0.42447	2.35585	0.44523	2.24604	0.46631	2.14451	0

Table AII-2.—Natural Tangents and Cotangents—Continued

M	25°	26°	27°	28°	29°						
I	TAN	COT	TAN	COT	TAN						
0	1.46631	2.14451	0.48773	2.05030	0.50953	1.96261	0.53171	1.88073	0.55431	1.80405	60
1	1.46666	2.14288	0.48809	2.04879	0.50989	1.96120	0.53208	1.87941	0.55469	1.80281	59
2	1.46702	2.14125	0.48845	2.04728	0.51026	1.95979	0.53246	1.87809	0.55507	1.80158	58
3	1.46737	2.13963	0.48881	2.04577	0.51063	1.95838	0.53283	1.87677	0.55545	1.80034	57
4	1.46772	2.13801	0.48917	2.04426	0.51099	1.95698	0.53320	1.87546	0.55583	1.79911	56
5	1.46808	2.13639	0.48953	2.04276	0.51136	1.95557	0.53358	1.87415	0.55621	1.79788	55
6	1.46843	2.13477	0.48989	2.04125	0.51173	1.95417	0.53395	1.87283	0.55659	1.79665	54
7	1.46879	2.13318	0.49026	2.03975	0.51209	1.95277	0.53432	1.87152	0.55697	1.79542	53
8	1.46914	2.13154	0.49062	2.03825	0.51246	1.95137	0.53470	1.87021	0.55734	1.79419	52
9	1.46950	2.12993	0.49098	2.03675	0.51283	1.94997	0.53507	1.86891	0.55774	1.79296	51
10	1.46983	2.12832	0.49134	2.03526	0.51319	1.94858	0.53545	1.86760	0.55812	1.79174	50
11	1.47021	2.12671	0.49170	2.03376	0.51356	1.94718	0.53582	1.86630	0.55850	1.79051	49
12	1.47056	2.12511	0.49206	2.03227	0.51393	1.94579	0.53620	1.86499	0.55888	1.78929	48
13	1.47092	2.12350	0.49242	2.03078	0.51430	1.94440	0.53657	1.86369	0.55926	1.78807	47
14	1.47128	2.12190	0.49278	2.02929	0.51467	1.94301	0.53694	1.86239	0.55964	1.78685	46
15	1.47163	2.12030	0.49315	2.02780	0.51503	1.94162	0.53732	1.86109	0.56003	1.78563	45
16	1.47199	2.11871	0.49351	2.02631	0.51540	1.94023	0.53769	1.85979	0.56041	1.78441	44
17	1.47234	2.11711	0.49387	2.02483	0.51577	1.93885	0.53807	1.85850	0.56079	1.78319	43
18	1.47270	2.11552	0.49423	2.02335	0.51614	1.93746	0.53844	1.85720	0.56117	1.78198	42
19	1.47305	2.11392	0.49459	2.02187	0.51651	1.93608	0.53882	1.85591	0.56156	1.78077	41
20	1.47341	2.11233	0.49495	2.02039	0.51688	1.93470	0.53920	1.85462	0.56194	1.77955	40
21	1.47377	2.11075	0.49532	2.01891	0.51724	1.93332	0.53957	1.85333	0.56232	1.77834	39
22	1.47412	2.10916	0.49568	2.01743	0.51761	1.93195	0.53995	1.85204	0.56270	1.77713	38
23	1.47448	2.10758	0.49604	2.01596	0.51798	1.93057	0.54032	1.85075	0.56309	1.77592	37
24	1.47483	2.10600	0.49640	2.01449	0.51835	1.92920	0.54070	1.84946	0.56347	1.77471	36
25	1.47519	2.10442	0.49677	2.01302	0.51872	1.92782	0.54107	1.84818	0.56385	1.77351	35
26	1.47555	2.10284	0.49713	2.01153	0.51909	1.92645	0.54145	1.84689	0.56424	1.77230	34
27	1.47590	2.10126	0.49749	2.01008	0.51946	1.92508	0.54183	1.84561	0.56462	1.77110	33
28	1.47626	2.09969	0.49786	2.00862	0.51983	1.92371	0.54220	1.84433	0.56501	1.76990	32
29	1.47662	2.09811	0.49822	2.00715	0.52020	1.92235	0.54258	1.84305	0.56539	1.76849	31
30	1.47698	2.09654	0.49858	2.00569	0.52057	1.92098	0.54296	1.84177	0.56577	1.76749	30
31	1.47733	2.09498	0.49894	2.00423	0.52094	1.91962	0.54333	1.84049	0.56616	1.76629	29
32	1.47769	2.09341	0.49931	2.00277	0.52131	1.91826	0.54371	1.83922	0.56654	1.76510	28
33	1.47805	2.09184	0.49967	2.00131	0.52168	1.91690	0.54409	1.83794	0.56693	1.76390	27
34	1.47840	2.09028	0.50004	1.99986	0.52205	1.91554	0.54446	1.83667	0.56731	1.76271	26
35	1.47876	2.08872	0.50040	1.99841	0.52242	1.91418	0.54484	1.83540	0.56769	1.76151	25
36	1.47912	2.08716	0.50076	1.99695	0.52279	1.91282	0.54522	1.83413	0.56808	1.76032	24
37	1.47948	2.08560	0.50113	1.99550	0.52316	1.91147	0.54560	1.83286	0.56846	1.75913	23
38	1.47984	2.08405	0.50149	1.99406	0.52353	1.91012	0.54597	1.83159	0.56885	1.75794	22
39	1.48019	2.08250	0.50185	1.99261	0.52390	1.90876	0.54635	1.83033	0.56923	1.75675	21
40	1.48055	2.08094	0.50222	1.99116	0.52427	1.90741	0.54673	1.82906	0.56962	1.75556	20
41	1.48091	2.07939	0.50258	1.98972	0.52464	1.90607	0.54711	1.82780	0.57000	1.75437	19
42	1.48127	2.07785	0.50295	1.98828	0.52501	1.90472	0.54748	1.82654	0.57039	1.75319	18
43	1.48163	2.07630	0.50331	1.98684	0.52538	1.90337	0.54786	1.82528	0.57078	1.75200	17
44	1.48198	2.07476	0.50368	1.98540	0.52575	1.90203	0.54824	1.82402	0.57116	1.75082	16
45	1.48234	2.07321	0.50404	1.98396	0.52613	1.90069	0.54862	1.82276	0.57155	1.74964	15
46	1.48270	2.07167	0.50441	1.98253	0.52650	1.89935	0.54900	1.82150	0.57193	1.74846	14
47	1.48306	2.07014	0.50477	1.98110	0.52687	1.89801	0.54938	1.82025	0.57232	1.74728	13
48	1.48342	2.06860	0.50514	1.97966	0.52724	1.89667	0.54975	1.81899	0.57271	1.74610	12
49	1.48378	2.06706	0.50550	1.97823	0.52761	1.89533	0.55013	1.81774	0.57309	1.74492	11
50	1.48414	2.06553	0.50587	1.97681	0.52798	1.89400	0.55051	1.81649	0.57348	1.74373	10
51	1.48450	2.06400	0.50623	1.97538	0.52834	1.89266	0.55089	1.81524	0.57386	1.74237	9
52	1.48486	2.06247	0.50660	1.97395	0.52873	1.89133	0.55127	1.81399	0.57425	1.74140	8
53	1.48521	2.06094	0.50696	1.97253	0.52910	1.89000	0.55165	1.81274	0.57464	1.74022	7
54	1.48557	2.05942	0.50733	1.97111	0.52947	1.88867	0.55203	1.81150	0.57503	1.73905	6
55	1.48593	2.05790	0.50769	1.96969	0.52985	1.88734	0.55241	1.81025	0.57541	1.73788	5
56	1.48629	2.05637	0.50806	1.96827	0.53022	1.88602	0.55279	1.80901	0.57580	1.73671	4
57	1.48665	2.05485	0.50843	1.96685	0.53059	1.88469	0.55317	1.80777	0.57619	1.73555	3
58	1.48701	2.05333	0.50879	1.96544	0.53096	1.88337	0.55355	1.80653	0.57657	1.73438	2
59	1.48737	2.05182	0.50916	1.96402	0.53134	1.88205	0.55393	1.80529	0.57696	1.73321	1
60	1.48773	2.05030	0.50953	1.96261	0.53171	1.88073	0.55431	1.80405	0.57735	1.73205	0

Table AII-2.—Natural Tangents and Cotangents—Continued

M	30°	31°	32°	33°	34°							
I	N	TAN	COT	TAN	COT	TAN	COT	TAN	COT	TAN	COT	
0	0.57735	1.73205	0.60086	1.66428	0.62487	1.60033	0.64941	1.53986	0.67451	1.48256	0.60	
1	0.57774	1.73089	0.60126	1.66318	0.62527	1.59930	0.64982	1.53888	0.67493	1.48163	0.59	
2	0.57813	1.72973	0.60165	1.66209	0.62568	1.59826	0.65024	1.53791	0.67536	1.48070	0.58	
3	0.57851	1.72857	0.60205	1.66099	0.62608	1.59723	0.65065	1.53693	0.67578	1.47977	0.57	
4	0.57890	1.72741	0.60245	1.65990	0.62649	1.59620	0.65106	1.53595	0.67620	1.47885	0.56	
5	0.57929	1.72625	0.60284	1.65881	0.62689	1.59517	0.65148	1.53497	0.67663	1.47792	0.55	
6	0.57968	1.72509	0.60324	1.65772	0.62730	1.59414	0.65189	1.53400	0.67705	1.47699	0.54	
7	0.58007	1.72393	0.60364	1.65663	0.62770	1.59311	0.65231	1.53302	0.67748	1.47607	0.53	
8	0.58046	1.72278	0.60403	1.65554	0.62811	1.59208	0.65272	1.53205	0.67790	1.47514	0.52	
9	0.58085	1.72163	0.60443	1.65445	0.62852	1.59105	0.65314	1.53107	0.67832	1.47422	0.51	
10	0.58124	1.72047	0.60483	1.65337	0.62892	1.59002	0.65355	1.53010	0.67873	1.47330	0.50	
11	0.58162	1.71932	0.60522	1.65228	0.62933	1.58900	0.65397	1.52913	0.67917	1.47238	0.49	
12	0.58201	1.71817	0.60562	1.65120	0.62973	1.58797	0.65438	1.52816	0.67960	1.47146	0.48	
13	0.58240	1.71702	0.60602	1.65011	0.63014	1.58695	0.65480	1.52719	0.68002	1.47053	0.47	
14	0.58279	1.71588	0.60642	1.64903	0.63055	1.58593	0.65521	1.52622	0.68045	1.46962	0.46	
15	0.58318	1.71473	0.60681	1.64795	0.63095	1.58490	0.65563	1.52523	0.68088	1.46870	0.45	
16	0.58357	1.71358	0.60721	1.64687	0.63136	1.58388	0.65604	1.52429	0.68130	1.46778	0.44	
17	0.58396	1.71244	0.60761	1.64579	0.63177	1.58286	0.65646	1.52332	0.68173	1.46686	0.43	
18	0.58435	1.71129	0.60801	1.64471	0.63217	1.58184	0.65688	1.52235	0.68215	1.46595	0.42	
19	0.58474	1.71015	0.60841	1.64363	0.63258	1.58083	0.65729	1.52139	0.68258	1.46503	0.41	
20	0.58513	1.70901	0.60881	1.64256	0.63299	1.57981	0.65771	1.52043	0.68301	1.46411	0.40	
21	0.58552	1.70787	0.60921	1.64148	0.63340	1.57879	0.65813	1.51946	0.68343	1.46320	0.39	
22	0.58591	1.70673	0.60960	1.64041	0.63380	1.57778	0.65854	1.51850	0.68386	1.46229	0.38	
23	0.58631	1.70560	0.61000	1.63934	0.63421	1.57676	0.65896	1.51754	0.68429	1.46137	0.37	
24	0.58670	1.70446	0.61040	1.63826	0.63462	1.57575	0.65938	1.51658	0.68471	1.46046	0.36	
25	0.58709	1.70332	0.61080	1.63719	0.63503	1.57474	0.65980	1.51562	0.68514	1.45953	0.35	
26	0.58748	1.70219	0.61120	1.63612	0.63544	1.57372	0.66021	1.51466	0.68557	1.45864	0.34	
27	0.58787	1.70106	0.61160	1.63505	0.63584	1.57271	0.66063	1.51370	0.68600	1.45773	0.33	
28	0.58826	1.69992	0.61200	1.63398	0.63625	1.57170	0.66105	1.51275	0.68642	1.45682	0.32	
29	0.58865	1.69879	0.61240	1.63292	0.63666	1.57069	0.66147	1.51179	0.68685	1.45592	0.31	
30	0.58905	1.69766	0.61280	1.63185	0.63707	1.56969	0.66189	1.51084	0.68728	1.45501	0.30	
31	0.58944	1.69653	0.61320	1.63079	0.63748	1.56868	0.66230	1.50988	0.68771	1.45410	0.29	
32	0.58983	1.69541	0.61360	1.62972	0.63789	1.56767	0.66272	1.50893	0.68814	1.45320	0.28	
33	0.59022	1.69428	0.61400	1.62866	0.63830	1.56667	0.66314	1.50797	0.68857	1.45229	0.27	
34	0.59061	1.69316	0.61440	1.62760	0.63871	1.56566	0.66356	1.50702	0.68900	1.45139	0.26	
35	0.59101	1.69203	0.61480	1.62654	0.63912	1.56466	0.66398	1.50607	0.68942	1.45049	0.25	
36	0.59140	1.69091	0.61520	1.62548	0.63953	1.56366	0.66440	1.50512	0.68985	1.44958	0.24	
37	0.59179	1.68979	0.61561	1.62442	0.63994	1.56265	0.66482	1.50417	0.69028	1.44868	0.23	
38	0.59218	1.68866	0.61601	1.62336	0.64035	1.56165	0.66524	1.50322	0.69071	1.44778	0.22	
39	0.59258	1.68754	0.61641	1.62230	0.64076	1.56065	0.66566	1.50228	0.69114	1.44688	0.21	
40	0.59297	1.68643	0.61681	1.62125	0.64117	1.55966	0.66608	1.50133	0.69157	1.44598	0.20	
41	0.59336	1.68531	0.61721	1.62019	0.64158	1.55866	0.66650	1.50038	0.69200	1.44508	0.19	
42	0.59376	1.68419	0.61761	1.61914	0.64199	1.55766	0.66692	1.49944	0.69243	1.44418	0.18	
43	0.59415	1.68308	0.61801	1.61808	0.64240	1.55666	0.66734	1.49849	0.69286	1.44329	0.17	
44	0.59454	1.68196	0.61842	1.61703	0.64281	1.55567	0.66776	1.49755	0.69329	1.44239	0.16	
45	0.59494	1.68085	0.61882	1.61598	0.64322	1.55467	0.66818	1.49661	0.69372	1.44149	0.15	
46	0.59533	1.67974	0.61922	1.61493	0.64363	1.55368	0.66860	1.49566	0.69416	1.44060	0.14	
47	0.59573	1.67863	0.61962	1.61388	0.64404	1.55269	0.66902	1.49472	0.69459	1.43970	0.13	
48	0.59612	1.67752	0.62003	1.61283	0.64446	1.55170	0.66944	1.49378	0.69502	1.43881	0.12	
49	0.59651	1.67641	0.62043	1.61179	0.64487	1.55071	0.66986	1.49284	0.69545	1.43792	0.11	
50	0.59691	1.67530	0.62083	1.61074	0.64528	1.54972	0.67028	1.49190	0.69588	1.43703	0.10	
51	0.59730	1.67419	0.62124	1.60970	0.64569	1.54873	0.67071	1.49097	0.69631	1.43614	0.09	
52	0.59770	1.67309	0.62164	1.60865	0.64610	1.54774	0.67113	1.49003	0.69675	1.43525	0.08	
53	0.59809	1.67198	0.62204	1.60761	0.64652	1.54675	0.67155	1.48909	0.69718	1.43436	0.07	
54	0.59849	1.67088	0.62245	1.60657	0.64693	1.54576	0.67197	1.48816	0.69761	1.43347	0.06	
55	0.59888	1.66978	0.62285	1.60553	0.64734	1.54478	0.67239	1.48722	0.69804	1.43258	0.05	
56	0.59928	1.66867	0.62325	1.60449	0.64775	1.54379	0.67282	1.48629	0.69847	1.43169	0.04	
57	0.59967	1.66757	0.62366	1.60345	0.64817	1.54281	0.67324	1.48536	0.69891	1.43080	0.03	
58	0.60007	1.66647	0.62406	1.60241	0.64858	1.54183	0.67366	1.48442	0.69934	1.42992	0.02	
59	0.60046	1.66538	0.62446	1.60137	0.64899	1.54085	0.67409	1.48349	0.69977	1.42903	0.01	
60	0.60086	1.66428	0.62487	1.60033	0.64941	1.53986	0.67451	1.48256	0.70021	1.42815	0.00	

Table AII-2.—Natural Tangents and Cotangents—Continued

M	35°	36°	37°	38°	39°						
I	TAN	COT	M								
0	0.70021	1.42815	0.72654	1.37638	0.75355	1.32704	0.78129	1.27994	0.80978	1.23490	60
1	0.70064	1.42726	0.72699	1.37554	0.75401	1.32624	0.78175	1.27917	0.81027	1.23416	59
2	0.70107	1.42438	0.72743	1.37470	0.75447	1.32544	0.78222	1.27841	0.81075	1.23343	58
3	0.70151	1.42550	0.72788	1.37386	0.75492	1.32464	0.78269	1.27764	0.81123	1.23270	57
4	0.70194	1.42462	0.72832	1.37302	0.75538	1.32384	0.78316	1.27688	0.81171	1.23196	56
5	0.70238	1.42374	0.72877	1.37218	0.75584	1.32304	0.78363	1.27611	0.81220	1.23123	55
6	0.70281	1.42286	0.72921	1.37134	0.75629	1.32224	0.78410	1.27555	0.81268	1.23050	54
7	0.70325	1.42198	0.72966	1.37050	0.75675	1.32144	0.78457	1.27458	0.81316	1.22977	53
8	0.70368	1.42110	0.73010	1.36967	0.75721	1.32064	0.78504	1.27382	0.81364	1.22904	52
9	0.70412	1.42022	0.73055	1.36883	0.75767	1.31984	0.78551	1.27306	0.81413	1.22831	51
10	0.70455	1.41934	0.73100	1.36800	0.75812	1.31904	0.78598	1.27230	0.81461	1.22758	50
11	0.70499	1.41847	0.73144	1.36716	0.75858	1.31825	0.78645	1.27153	0.81510	1.22685	49
12	0.70542	1.41759	0.73189	1.36633	0.75904	1.31745	0.78692	1.27077	0.81558	1.22612	48
13	0.70586	1.41672	0.73234	1.36549	0.75950	1.31666	0.78739	1.27001	0.81606	1.22539	47
14	0.70629	1.41584	0.73278	1.36466	0.75996	1.31586	0.78786	1.26925	0.81655	1.22467	46
15	0.70673	1.41497	0.73323	1.36383	0.76042	1.31507	0.78834	1.26849	0.81703	1.22394	45
16	0.70717	1.41409	0.73368	1.36300	0.76088	1.31427	0.78881	1.26774	0.81752	1.22321	44
17	0.70760	1.41322	0.73413	1.36217	0.76134	1.31348	0.78928	1.26698	0.81800	1.22249	43
18	0.70804	1.41235	0.73457	1.36134	0.76180	1.31269	0.78975	1.26622	0.81849	1.22176	42
19	0.70848	1.41148	0.73502	1.36051	0.76226	1.31190	0.79022	1.26546	0.81898	1.22104	41
20	0.70891	1.41061	0.73547	1.35968	0.76272	1.31110	0.79070	1.26471	0.81946	1.22031	40
21	0.70935	1.40974	0.73592	1.35885	0.76318	1.31031	0.79117	1.26395	0.81993	1.21959	39
22	0.70979	1.40887	0.73637	1.35802	0.76364	1.30952	0.79164	1.26319	0.82044	1.21884	38
23	0.71023	1.40800	0.73681	1.35719	0.76410	1.30873	0.79212	1.26244	0.82092	1.21814	37
24	0.71066	1.40714	0.73724	1.35637	0.76456	1.30795	0.79259	1.26169	0.82141	1.21742	36
25	0.71110	1.40627	0.73771	1.35554	0.76502	1.30716	0.79306	1.26093	0.82190	1.21670	35
26	0.71154	1.40540	0.73816	1.35472	0.76548	1.30637	0.79354	1.26018	0.82238	1.21598	34
27	0.71198	1.40454	0.73861	1.35389	0.76594	1.30558	0.79401	1.25943	0.82287	1.21526	33
28	0.71242	1.40367	0.73906	1.35307	0.76640	1.30480	0.79449	1.25867	0.82334	1.21454	32
29	0.71285	1.40281	0.73951	1.35224	0.76686	1.30401	0.79496	1.25792	0.82385	1.21382	31
30	0.71329	1.40193	0.73996	1.35142	0.76733	1.30323	0.79544	1.25717	0.82434	1.21310	30
31	0.71373	1.40109	0.74041	1.35060	0.76779	1.30244	0.79591	1.25642	0.82483	1.21238	29
32	0.71417	1.40022	0.74084	1.34978	0.76825	1.30166	0.79639	1.25567	0.82531	1.21164	28
33	0.71461	1.39934	0.74131	1.34896	0.76871	1.30087	0.79686	1.25492	0.82580	1.21094	27
34	0.71505	1.39850	0.74176	1.34814	0.76918	1.30009	0.79734	1.25417	0.82629	1.21023	26
35	0.71549	1.39764	0.74221	1.34732	0.76964	1.29931	0.79781	1.25343	0.82678	1.20951	25
36	0.71593	1.39679	0.74267	1.34650	0.77010	1.29853	0.79829	1.25266	0.82727	1.20879	24
37	0.71637	1.39593	0.74312	1.34568	0.77057	1.29775	0.79877	1.25193	0.82776	1.20808	23
38	0.71681	1.39507	0.74357	1.34487	0.77103	1.29696	0.79924	1.25118	0.82825	1.20736	22
39	0.71725	1.39421	0.74402	1.34405	0.77149	1.29618	0.79972	1.25044	0.82874	1.20665	21
40	0.71769	1.39336	0.74447	1.34323	0.77196	1.29541	0.80020	1.24969	0.82923	1.20593	20
41	0.71813	1.39250	0.74492	1.34242	0.77242	1.29463	0.80067	1.24893	0.82972	1.20522	19
42	0.71857	1.39163	0.74538	1.34160	0.77289	1.29385	0.80113	1.24820	0.83022	1.20451	18
43	0.71901	1.39079	0.74583	1.34079	0.77335	1.29307	0.80163	1.24746	0.83071	1.20379	17
44	0.71946	1.38994	0.74628	1.33998	0.77382	1.29229	0.80211	1.24672	0.83120	1.20308	16
45	0.71990	1.38909	0.74674	1.33916	0.77428	1.29152	0.80258	1.24597	0.83169	1.20237	15
46	0.72034	1.38824	0.74719	1.33835	0.77475	1.29074	0.80304	1.24523	0.83218	1.20166	14
47	0.72078	1.38738	0.74764	1.33754	0.77521	1.28997	0.80354	1.24449	0.83268	1.20095	13
48	0.72122	1.38653	0.74810	1.33673	0.77568	1.28919	0.80402	1.24375	0.83317	1.20024	12
49	0.72167	1.38568	0.74855	1.33592	0.77615	1.28842	0.80450	1.24301	0.83366	1.19953	11
50	0.72211	1.38484	0.74900	1.33511	0.77661	1.28764	0.80498	1.24227	0.83415	1.19882	10
51	0.72255	1.38399	0.74946	1.33430	0.77708	1.28687	0.80546	1.24153	0.83465	1.19811	9
52	0.72299	1.38314	0.74991	1.33349							

Table AII-2.—Natural Tangents and Cotangents—Continued

M	40°	41°	42°	43°	44°						
I	TAN	COT	M								
0	0.83910	1.19175	0.86929	1.15037	0.90040	1.11061	0.93252	1.07237	0.96369	1.03553	60
1	0.83960	1.19105	0.86980	1.14969	0.90093	1.10996	0.93306	1.07174	0.96625	1.03493	59
2	0.84009	1.19035	0.87031	1.14902	0.90146	1.10931	0.93360	1.07112	0.96681	1.03433	58
3	0.84059	1.18964	0.87082	1.14834	0.90199	1.10867	0.93415	1.07049	0.96738	1.03372	57
4	0.84108	1.18894	0.87133	1.14767	0.90251	1.10802	0.93469	1.06987	0.96794	1.03312	56
5	0.84158	1.18824	0.87184	1.14699	0.90304	1.10737	0.93524	1.06925	0.96850	1.03252	55
6	0.84208	1.18754	0.87236	1.14632	0.90357	1.10672	0.93578	1.06862	0.96907	1.03192	54
7	0.84258	1.18684	0.87287	1.14565	0.90410	1.10607	0.93633	1.06800	0.96963	1.03132	53
8	0.84307	1.18614	0.87338	1.14498	0.90463	1.10543	0.93688	1.06738	0.97020	1.03072	52
9	0.84357	1.18544	0.87389	1.14430	0.90516	1.10478	0.93742	1.06676	0.97076	1.03012	51
10	0.84407	1.18474	0.87441	1.14363	0.90569	1.10414	0.93797	1.06613	0.97133	1.02952	50
11	0.84457	1.18404	0.87492	1.14296	0.90621	1.10349	0.93852	1.06551	0.97189	1.02892	49
12	0.84507	1.18334	0.87543	1.14229	0.90674	1.10285	0.93906	1.06489	0.97246	1.02832	48
13	0.84556	1.18264	0.87595	1.14162	0.90727	1.10220	0.93961	1.06427	0.97302	1.02772	47
14	0.84606	1.18194	0.87646	1.14095	0.90781	1.10156	0.94016	1.06365	0.97359	1.02713	46
15	0.84656	1.18125	0.87698	1.14028	0.90834	1.10091	0.94071	1.06303	0.97416	1.02653	45
16	0.84706	1.18055	0.87749	1.13961	0.90887	1.10027	0.94125	1.06241	0.97472	1.02593	44
17	0.84756	1.17986	0.87801	1.13894	0.90940	1.09963	0.94180	1.06179	0.97529	1.02533	43
18	0.84806	1.17916	0.87852	1.13828	0.90993	1.09899	0.94235	1.06117	0.97586	1.02474	42
19	0.84856	1.17846	0.87904	1.13761	0.91046	1.09834	0.94290	1.06056	0.97643	1.02414	41
20	0.84906	1.17777	0.87955	1.13694	0.91099	1.09770	0.94343	1.05994	0.97700	1.02355	40
21	0.84956	1.17708	0.88007	1.13627	0.91153	1.09706	0.94400	1.05932	0.97756	1.02295	39
22	0.85006	1.17638	0.88059	1.13561	0.91204	1.09642	0.94455	1.05870	0.97813	1.02236	38
23	0.85057	1.17569	0.88110	1.13494	0.91259	1.09578	0.94510	1.05809	0.97870	1.02176	37
24	0.85107	1.17500	0.88162	1.13428	0.91313	1.09514	0.94565	1.05747	0.97927	1.02117	36
25	0.85157	1.17430	0.88214	1.13361	0.91366	1.09450	0.94620	1.05685	0.97984	1.02057	35
26	0.85207	1.17361	0.88265	1.13295	0.91419	1.09386	0.94676	1.05624	0.98041	1.01998	34
27	0.85257	1.17292	0.88317	1.13228	0.91473	1.09322	0.94731	1.05562	0.98098	1.01939	33
28	0.85308	1.17223	0.88369	1.13162	0.91526	1.09258	0.94786	1.05501	0.98155	1.01879	32
29	0.85358	1.17154	0.88421	1.13096	0.91580	1.09195	0.94841	1.05439	0.98213	1.01820	31
30	0.85408	1.17085	0.88473	1.13029	0.91633	1.09131	0.94896	1.05378	0.98270	1.01761	30
31	0.85458	1.17016	0.88524	1.12963	0.91687	1.09067	0.94952	1.05317	0.98327	1.01702	29
32	0.85509	1.16947	0.88576	1.12897	0.91740	1.09003	0.95007	1.05255	0.98384	1.01642	28
33	0.85559	1.16878	0.88628	1.12831	0.91794	1.08940	0.95062	1.05194	0.98441	1.01583	27
34	0.85609	1.16809	0.88680	1.12765	0.91847	1.08876	0.95118	1.05133	0.98499	1.01524	26
35	0.85660	1.16741	0.88732	1.12699	0.91901	1.08813	0.95173	1.05072	0.98536	1.01465	25
36	0.85710	1.16672	0.88784	1.12633	0.91955	1.08749	0.95229	1.05010	0.98613	1.01406	24
37	0.85761	1.16603	0.88836	1.12567	0.92008	1.08686	0.95284	1.04949	0.98671	1.01347	23
38	0.85811	1.16535	0.88888	1.12501	0.92062	1.08622	0.95340	1.04888	0.98728	1.01268	22
39	0.85862	1.16466	0.88940	1.12435	0.92116	1.08559	0.95395	1.04827	0.98786	1.01229	21
40	0.85912	1.16398	0.88992	1.12369	0.92170	1.08496	0.95451	1.04766	0.98843	1.01170	20
41	0.85963	1.16329	0.89045	1.12303	0.92224	1.08432	0.95506	1.04705	0.98901	1.01112	19
42	0.86014	1.16261	0.89097	1.12238	0.92277	1.08369	0.95562	1.04644	0.98958	1.01053	18
43	0.86064	1.16192	0.89149	1.12172	0.92331	1.08304	0.95618	1.04583	0.99016	1.00994	17
44	0.86115	1.16124	0.89201	1.12106	0.92385	1.08243	0.95673	1.04522	0.99073	1.00935	16
45	0.86166	1.16056	0.89253	1.12041	0.92439	1.08179	0.95729	1.04461	0.99131	1.00876	15
46	0.86216	1.15987	0.89306	1.11975	0.92493	1.08116	0.95785	1.04401	0.99189	1.00818	14
47	0.86267	1.15919	0.89358	1.11909	0.92547	1.08053	0.95841	1.04340	0.99247	1.00759	13
48	0.86318	1.15851	0.89410	1.11844	0.92601	1.07990	0.95897	1.04279	0.99304	1.00701	12
49	0.86368	1.15783	0.89463	1.11778	0.92655	1.07927	0.95952	1.04218	0.99362	1.00642	11
50	0.86419	1.15715	0.89515	1.11713	0.92709	1.07864	0.96008	1.04158	0.99420	1.00583	10
51	0.86470	1.15647	0.89567	1.11648	0.92763	1.07801	0.96064	1.04097	0.99478	1.00523	9
52	0.86521	1.15579	0.89620	1.11582	0.92817	1.07738	0.96120	1.04036	0.99536	1.00467	8
53	0.86572	1.15511	0.89672	1.11517	0.92872	1.07676	0.96176	1.03976	0.99594	1.00408	7
54	0.86623	1.15443	0.89725	1.11452	0.92926	1.07613	0.96232	1.03915	0.99652	1.00350	6
55	0.86674	1.15375	0.89777	1.11387	0.92980	1.07550	0.96288	1.03855	0.99710	1.00291	5
56	0.86725	1.15308	0.89830	1.11321	0.93034	1.07487	0.96344	1.03794	0.99768	1.00233	4
57	0.86776	1.15240	0.89883	1.11256	0.93088	1.07425	0.96400	1.03734	0.99826	1.00175	3
58	0.86827	1.15172	0.89935	1.11191	0.93143	1.07362	0.96457	1.03674	0.99884	1.00116	2
59	0.86878	1.15104	0.89988	1.11126	0.93197	1.07299	0.96513	1.03613	0.99942	1.00058	1
60	0.86929	1.15037	0.90040	1.11061	0.93252	1.07237	0.96569	1.03553	1.00000	1.00000	0

COT	TAN	M								
49°	48°	47°	46°	45°						I

Table AII-3.—Stadia Reduction

Minutes	0°		1°		2°		3°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0.....	100.00	0.00	99.97	1.74	99.88	3.49	99.73	5.23
2.....	100.00	0.06	99.97	1.80	99.87	3.55	99.72	5.28
4.....	100.00	0.12	99.97	1.86	99.87	3.60	99.71	5.34
6.....	100.00	0.17	99.96	1.92	99.87	3.66	99.71	5.40
8.....	100.00	0.23	99.96	1.98	99.86	3.72	99.70	5.46
10.....	100.00	0.29	99.96	2.04	99.86	3.78	99.69	5.52
12.....	100.00	0.35	99.96	2.09	99.85	3.84	99.69	5.57
14.....	100.00	0.41	99.95	2.15	99.85	3.90	99.68	5.63
16.....	100.00	0.47	99.95	2.21	99.84	3.95	99.68	5.69
18.....	100.00	0.52	99.95	2.27	99.84	4.01	99.67	5.75
20.....	100.00	0.58	99.95	2.33	99.83	4.07	99.66	5.80
22.....	100.00	0.64	99.94	2.38	99.83	4.13	99.66	5.86
24.....	100.00	0.70	99.94	2.44	99.82	4.18	99.65	5.92
26.....	99.99	0.76	99.94	2.50	99.82	4.24	99.64	5.98
28.....	99.99	0.81	99.93	2.56	99.81	4.30	99.63	6.04
30.....	99.99	0.87	99.93	2.62	99.81	4.36	99.63	6.09
32.....	99.99	0.93	99.93	2.67	99.80	4.42	99.62	6.15
34.....	99.99	0.99	99.93	2.73	99.80	4.48	99.62	6.21
36.....	99.99	1.05	99.92	2.79	99.79	4.53	99.61	6.27
38.....	99.99	1.11	99.92	2.85	99.79	4.59	99.60	6.33
40.....	99.99	1.16	99.92	2.91	99.78	4.65	99.59	6.38
42.....	99.99	1.22	99.91	2.97	99.78	4.71	99.59	6.44
44.....	99.98	1.28	99.91	3.02	99.77	4.76	99.58	6.50
46.....	99.98	1.34	99.90	3.08	99.77	4.82	99.57	6.56
48.....	99.98	1.40	99.90	3.14	99.76	4.88	99.56	6.61
50.....	99.98	1.45	99.90	3.20	99.76	4.94	99.56	6.67
52.....	99.98	1.51	99.89	3.26	99.75	4.99	99.55	6.73
54.....	99.98	1.57	99.89	3.31	99.74	5.05	99.54	6.78
56.....	99.97	1.63	99.89	3.37	99.74	5.11	99.53	6.84
58.....	99.97	1.69	99.88	3.43	99.73	5.17	99.52	6.90
60.....	99.97	1.74	99.88	3.49	99.73	5.23	99.51	6.96
C = 0.75...	0.75	0.01	0.75	0.02	0.75	0.03	0.75	0.05
C = 1.00...	1.00	0.01	1.00	0.03	1.00	0.04	1.00	0.06
C = 1.25...	1.25	0.02	1.25	0.03	1.25	0.05	1.25	0.08

Table AII-3.—Stadia Reduction—Continued

Minutes	4°		5°		6°		7°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0.....	99.51	6.96	99.24	8.68	98.91	10.40	98.51	12.10
2.....	99.51	7.02	99.23	8.74	98.90	10.45	98.50	12.15
4.....	99.50	7.07	99.22	8.80	98.88	10.51	98.48	12.21
6.....	99.49	7.13	99.21	8.85	98.87	10.57	98.47	12.26
8.....	99.48	7.19	99.20	8.91	98.86	10.62	98.46	12.32
10.....	99.47	7.25	99.19	8.97	98.85	10.68	98.44	12.38
12.....	99.46	7.30	99.18	9.03	98.83	10.74	98.43	12.43
14.....	99.46	7.36	99.17	9.08	98.82	10.79	98.41	12.49
16.....	99.45	7.42	99.16	9.14	98.81	10.85	98.40	12.55
18.....	99.44	7.48	99.15	9.20	98.80	10.91	98.39	12.60
20.....	99.43	7.53	99.14	9.25	98.78	10.96	98.37	12.66
22.....	99.42	7.59	99.13	9.31	98.77	11.02	98.36	12.72
24.....	99.41	7.65	99.11	9.37	98.76	11.08	98.34	12.77
26.....	99.40	7.71	99.10	9.43	98.74	11.13	98.33	12.83
28.....	99.39	7.76	99.09	9.48	98.73	11.19	98.31	12.88
30.....	99.38	7.82	99.08	9.54	98.72	11.25	98.29	12.94
32.....	99.38	7.88	99.07	9.60	98.71	11.30	98.28	13.00
34.....	99.37	7.94	99.06	9.65	98.69	11.36	98.27	13.05
36.....	99.36	7.99	99.05	9.71	98.68	11.42	98.25	13.11
38.....	99.35	8.05	99.04	9.77	98.67	11.47	98.24	13.17
40.....	99.34	8.11	99.03	9.83	98.65	11.53	98.22	13.22
42.....	99.33	8.17	99.01	9.88	98.64	11.59	98.20	13.28
44.....	99.32	8.22	99.00	9.94	98.63	11.64	98.19	13.33
46.....	99.31	8.28	98.99	10.00	98.61	11.70	98.17	13.39
48.....	99.30	8.34	98.98	10.05	98.60	11.76	98.16	13.45
50.....	99.29	8.40	98.97	10.11	98.58	11.81	98.14	13.50
52.....	99.28	8.45	98.96	10.17	98.57	11.87	98.13	13.56
54.....	99.27	8.51	98.94	10.22	98.56	11.93	98.11	13.61
56.....	99.26	8.57	98.93	10.28	98.54	11.98	98.10	13.67
58.....	99.25	8.63	98.92	10.34	98.53	12.04	98.08	13.73
60.....	99.24	8.68	98.91	10.40	98.51	12.10	98.06	13.78
C = 0.75...	0.75	0.06	0.75	0.07	0.75	0.08	0.74	0.10
C = 1.00...	1.00	0.08	0.99	0.09	0.99	0.11	0.99	0.13
C = 1.25...	1.25	0.10	1.24	0.11	1.24	0.14	1.24	0.16

Table AII-3.—Stadia Reduction—Continued

Minutes	8°		9°		10°		11°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0.....	98.06	13.78	97.55	15.45	96.98	17.10	96.36	18.73
2.....	98.05	13.84	97.53	15.51	96.96	17.16	96.34	18.78
4.....	98.03	13.89	97.52	15.56	96.94	17.21	96.32	18.84
6.....	98.01	13.95	97.50	15.62	96.92	17.26	96.29	18.89
8.....	98.00	14.01	97.48	15.67	96.90	17.32	96.27	18.95
10.....	97.98	14.06	97.46	15.73	96.88	17.37	96.25	19.00
12.....	97.97	14.12	97.44	15.78	96.86	17.43	96.23	19.05
14.....	97.95	14.17	97.43	15.84	96.84	17.48	96.21	19.11
16.....	97.93	14.23	97.41	15.89	96.82	17.54	96.18	19.16
18.....	97.92	14.28	97.39	15.95	96.80	17.59	96.16	19.21
20.....	97.90	14.34	97.37	16.00	96.78	17.65	96.14	19.27
22.....	97.88	14.40	97.35	16.06	96.76	17.70	96.12	19.32
24.....	97.87	14.45	97.33	16.11	96.74	17.76	96.09	19.38
26.....	97.85	14.51	97.31	16.17	96.72	17.81	96.07	19.43
28.....	97.83	14.56	97.29	16.22	96.70	17.86	96.05	19.48
30.....	97.82	14.62	97.28	16.28	96.68	17.92	96.03	19.54
32.....	97.80	14.67	97.26	16.33	96.66	17.97	96.00	19.59
34.....	97.78	14.73	97.24	16.39	96.64	18.03	95.98	19.64
36.....	97.76	14.79	97.22	16.44	96.62	18.08	95.96	19.70
38.....	97.75	14.84	97.20	16.50	96.60	18.14	95.93	19.75
40.....	97.73	14.90	97.18	16.55	96.57	18.19	95.91	19.80
42.....	97.71	14.95	97.16	16.61	96.55	18.24	95.89	19.86
44.....	97.69	15.01	97.14	16.66	96.53	18.30	95.86	19.91
46.....	97.68	15.06	97.12	16.72	96.51	18.35	95.84	19.96
48.....	97.66	15.12	97.10	16.77	96.49	18.41	95.82	20.02
50.....	97.64	15.17	97.08	16.83	96.47	18.46	95.79	20.07
52.....	97.62	15.23	97.06	16.88	96.45	18.51	95.77	20.12
54.....	97.61	15.28	97.04	16.94	96.42	18.57	95.75	20.18
56.....	97.59	15.34	97.02	16.99	96.40	18.62	95.72	20.23
58.....	97.57	15.40	97.00	17.05	96.38	18.68	95.70	20.28
60.....	97.55	15.45	96.98	17.10	96.36	18.73	95.68	20.34
C = 0.75...	0.74	0.11	0.74	0.12	0.74	0.14	0.73	0.15
C = 1.00...	0.99	0.15	0.99	0.16	0.98	0.18	0.98	0.20
C = 1.25...	1.23	0.18	1.23	0.21	1.23	0.23	1.22	0.25

Table AII-3.—Stadia reduction—Continued

Minutes	12°		13°		14°		15°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0.....	95.68	20.34	94.94	21.92	94.15	23.47	93.30	25.00
2.....	95.65	20.39	94.91	21.97	94.12	23.52	93.27	25.05
4.....	95.63	20.44	94.89	22.02	94.09	23.58	93.24	25.10
6.....	95.61	20.50	94.86	22.08	94.07	23.63	93.21	25.15
8.....	95.58	20.55	94.84	22.13	94.04	23.68	93.18	25.20
10.....	95.56	20.60	94.81	22.18	94.01	23.73	93.16	25.25
12.....	95.53	20.66	94.79	22.23	93.98	23.78	93.13	25.30
14.....	95.51	20.71	94.76	22.28	93.95	23.83	93.10	25.35
16.....	95.49	20.76	94.73	22.34	93.93	23.88	93.07	25.40
18.....	95.46	20.81	94.71	22.39	93.90	23.93	93.04	25.45
20.....	95.44	20.87	94.68	22.44	93.87	23.99	93.01	25.50
22.....	95.41	20.92	94.66	22.49	93.84	24.04	92.98	25.55
24.....	95.39	20.97	94.63	22.54	93.81	24.09	92.95	25.60
26.....	95.36	21.03	94.60	22.60	93.79	24.14	92.92	25.65
28.....	95.34	21.08	94.58	22.65	93.76	24.19	92.89	25.70
30.....	95.32	21.13	94.55	22.70	93.73	24.24	92.86	25.75
32.....	95.29	21.18	94.52	22.75	93.70	24.29	92.83	25.80
34.....	95.27	21.24	94.50	22.80	93.67	24.34	92.80	25.85
36.....	95.24	21.29	94.47	22.85	93.65	24.39	92.77	25.90
38.....	95.22	21.34	94.44	22.91	93.62	24.44	92.74	25.95
40.....	95.19	21.39	94.42	22.96	93.59	24.49	92.71	26.00
42.....	95.17	21.45	94.39	23.01	93.56	24.55	92.68	26.05
44.....	95.14	21.50	94.36	23.06	93.53	24.60	92.65	26.10
46.....	95.12	21.55	94.34	23.11	93.50	24.65	92.62	26.15
48.....	95.09	21.60	94.31	23.16	93.47	24.70	92.59	26.20
50.....	95.07	21.66	94.28	23.22	93.45	24.75	92.56	26.25
52.....	95.04	21.71	94.26	23.27	93.42	24.80	92.53	26.30
54.....	95.02	21.76	94.23	23.32	93.39	24.85	92.49	26.35
56.....	94.99	21.81	94.20	23.37	93.36	24.90	92.46	26.40
58.....	94.97	21.87	94.17	23.42	93.33	24.95	92.43	26.45
60.....	94.94	21.92	94.15	23.47	93.30	25.00	92.40	26.50
C = 0.75...	0.73	0.16	0.73	0.17	0.73	0.19	0.72	0.20
C = 1.00...	0.98	0.22	0.97	0.23	0.97	0.25	0.96	0.27
C = 1.25...	1.22	0.27	1.21	0.29	1.21	0.31	1.20	0.34

Table AII-3.—Stadia Reduction—Continued

Minutes	16°		17°		18°		19°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0.....	92.40	26.50	91.45	27.96	90.45	29.39	89.40	30.78
2.....	92.37	26.55	91.42	28.01	90.42	29.44	89.36	30.83
4.....	92.34	26.59	91.39	28.06	90.38	29.48	89.33	30.87
6.....	92.31	26.64	91.35	28.10	90.35	29.53	89.29	30.92
8.....	92.28	26.69	91.32	28.15	90.31	29.58	89.26	30.97
10.....	92.25	26.74	91.29	28.20	90.28	29.62	89.22	31.01
12.....	92.22	26.79	91.26	28.25	90.24	29.67	89.18	31.06
14.....	92.19	26.84	91.22	28.30	90.21	29.72	89.15	31.10
16.....	92.15	26.89	91.19	28.34	90.18	29.76	89.11	31.15
18.....	92.12	26.94	91.16	28.39	90.14	29.81	89.08	31.19
20.....	92.09	26.99	91.12	28.44	90.11	29.86	89.04	31.24
22.....	92.06	27.04	91.09	28.49	90.07	29.90	89.00	31.28
24.....	92.03	27.09	91.06	28.54	90.04	29.95	88.96	31.33
26.....	92.00	27.13	91.02	28.58	90.00	30.00	88.93	31.38
28.....	91.97	27.18	90.99	28.63	89.97	30.04	88.89	31.42
30.....	91.93	27.23	90.96	28.68	89.93	30.09	88.86	31.47
32.....	91.90	27.28	90.92	28.73	89.90	30.14	88.82	31.51
34.....	91.87	27.33	90.89	28.77	89.86	30.19	88.78	31.56
36.....	91.84	27.38	90.86	28.82	89.83	30.23	88.75	31.60
38.....	91.81	27.43	90.82	28.87	89.79	30.28	88.71	31.65
40.....	91.77	27.48	90.79	28.92	89.76	30.32	88.67	31.69
42.....	91.74	27.52	90.76	28.96	89.72	30.37	88.64	31.74
44.....	91.71	27.57	90.72	29.01	89.69	30.41	88.60	31.78
46.....	91.68	27.62	90.69	29.06	89.65	30.46	88.56	31.83
48.....	91.65	27.67	90.66	29.11	89.61	30.51	88.53	31.87
50.....	91.61	27.72	90.62	29.15	89.58	30.55	88.49	31.92
52.....	91.58	27.77	90.59	29.20	89.54	30.60	88.45	31.96
54.....	91.55	27.81	90.55	29.25	89.51	30.65	88.41	32.01
56.....	91.52	27.86	90.52	29.30	89.47	30.69	88.38	32.05
58.....	91.48	27.91	90.48	29.34	89.44	30.74	88.34	32.09
60.....	91.45	27.96	90.45	29.39	89.40	30.78	88.30	32.14
C = 0.75...	0.72	0.21	0.72	0.23	0.71	0.24	0.71	0.25
C = 1.00...	0.96	0.28	0.95	0.30	0.95	0.32	0.94	0.33
C = 1.25...	1.20	0.35	1.19	0.38	1.19	0.40	1.18	0.42

Table AII-3.—Stadia Reduction—Continued

Minutes	20°		21°		22°		23°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0.....	88.30	32.14	87.16	33.46	85.97	34.73	84.73	35.97
2.....	88.26	32.18	87.12	33.50	85.93	34.77	84.69	36.01
4.....	88.23	32.23	87.08	33.54	85.89	34.82	84.65	36.05
6.....	88.19	32.27	87.04	33.59	85.85	34.86	84.61	36.09
8.....	88.15	32.32	87.00	33.63	85.80	34.90	84.57	36.13
10.....	88.11	32.36	86.96	33.67	85.76	34.94	84.52	36.17
12.....	88.08	32.41	86.92	33.72	85.72	34.98	84.48	36.21
14.....	88.04	32.45	86.88	33.76	85.68	35.02	84.44	36.25
16.....	88.00	32.49	86.84	33.80	85.64	35.07	84.40	36.29
18.....	87.96	32.54	86.80	33.84	85.60	35.11	84.35	36.33
20.....	87.93	32.58	86.77	33.89	85.56	35.15	84.31	36.37
22.....	87.89	32.63	86.73	33.93	85.52	35.19	84.27	36.41
24.....	87.85	32.67	86.69	33.97	85.48	35.23	84.23	36.45
26.....	87.81	32.72	86.65	34.01	85.44	35.27	84.18	36.49
28.....	87.77	32.76	86.61	34.06	85.40	35.31	84.14	36.53
30.....	87.74	32.80	86.57	34.10	85.36	35.36	84.10	36.57
32.....	87.70	32.85	86.53	34.14	85.31	35.40	84.06	36.61
34.....	87.66	32.89	86.49	34.18	85.27	35.44	84.01	36.65
36.....	87.62	32.93	86.45	34.23	85.23	35.48	83.97	36.69
38.....	87.58	32.98	86.41	34.27	85.19	35.52	83.93	36.73
40.....	87.54	33.02	86.37	34.31	85.15	35.56	83.89	36.77
42.....	87.51	33.07	86.33	34.35	85.11	35.60	83.84	36.80
44.....	87.47	33.11	86.29	34.40	85.07	35.64	83.80	36.84
46.....	87.43	33.15	86.25	34.44	85.02	35.68	83.76	36.88
48.....	87.39	33.20	86.21	34.48	84.98	35.72	83.72	36.92
50.....	87.35	33.24	86.17	34.52	84.94	35.76	83.67	36.96
52.....	87.31	33.28	86.13	34.57	84.90	35.80	83.63	37.00
54.....	87.27	33.33	86.09	34.61	84.86	35.85	83.59	37.04
56.....	87.24	33.37	86.05	34.65	84.82	35.89	83.54	37.08
58.....	87.20	33.41	86.01	34.69	84.77	35.93	83.50	37.12
60.....	87.16	33.46	85.97	34.73	84.73	35.97	83.46	37.16
C = 0.75....	0.70	0.26	0.70	0.27	0.69	0.29	0.69	0.30
C = 1.00....	0.94	0.35	0.93	0.37	0.92	0.38	0.92	0.40
C = 1.25....	1.17	0.44	1.16	0.46	1.15	0.48	1.15	0.50

Table AII-3.—Stadia Reduction—Continued

Minutes	24°		25°		26°		27°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0.....	83.46	37.16	82.14	38.30	80.78	39.40	79.39	40.45
2.....	83.41	37.20	82.09	38.34	80.74	39.44	79.34	40.49
4.....	83.37	37.23	82.05	38.38	80.69	39.47	79.30	40.52
6.....	83.33	37.27	82.01	38.41	80.65	39.51	79.25	40.55
8.....	83.28	37.31	81.96	38.45	80.60	39.54	79.20	40.59
10.....	83.24	37.35	81.92	38.49	80.55	39.58	79.15	40.62
12.....	83.20	37.39	81.87	38.53	80.51	39.61	79.11	40.66
14.....	83.15	37.43	81.83	38.56	80.46	39.65	79.06	40.69
16.....	83.11	37.47	81.78	38.60	80.41	39.69	79.01	40.72
18.....	83.07	37.51	81.74	38.64	80.37	39.72	78.96	40.76
20.....	83.02	37.54	81.69	38.67	80.32	39.76	78.92	40.79
22.....	82.98	37.58	81.65	38.71	80.28	39.79	78.87	40.82
24.....	82.93	37.62	81.60	38.75	80.23	39.83	78.82	40.86
26.....	82.89	37.66	81.56	38.78	80.18	39.86	78.77	40.89
28.....	82.85	37.70	81.51	38.82	80.14	39.90	78.73	40.92
30.....	82.80	37.74	81.47	38.86	80.09	39.93	78.68	40.96
32.....	82.76	37.77	81.42	38.89	80.04	39.97	78.63	40.99
34.....	82.72	37.81	81.38	38.93	80.00	40.00	78.58	41.02
36.....	82.67	37.85	81.33	38.97	79.95	40.04	78.54	41.06
38.....	82.63	37.89	81.28	39.00	79.90	40.07	78.49	41.09
40.....	82.58	37.93	81.24	39.04	79.86	40.11	78.44	41.12
42.....	82.54	37.96	81.19	39.08	79.81	40.14	78.39	41.16
44.....	82.49	38.00	81.15	39.11	79.76	40.18	78.34	41.19
46.....	82.45	38.04	81.10	39.15	79.72	40.21	78.30	41.22
48.....	82.41	38.08	81.06	39.18	79.67	40.24	78.25	41.26
50.....	82.36	38.11	81.01	39.22	79.62	40.28	78.20	41.29
52.....	82.32	38.15	80.97	39.26	79.58	40.31	78.15	41.32
54.....	82.27	38.19	80.92	39.29	79.53	40.35	78.10	41.35
56.....	82.23	38.23	80.87	39.33	79.48	40.38	78.06	41.39
58.....	82.18	38.26	80.83	39.36	79.44	40.42	78.01	41.42
60.....	82.14	38.30	80.78	39.40	79.39	40.45	77.96	41.45
C = 0.75...	0.68	0.31	0.68	0.32	0.67	0.33	0.66	0.35
C = 1.00...	0.91	0.41	0.90	0.43	0.89	0.45	0.89	0.46
C = 1.25...	1.14	0.52	1.13	0.54	1.12	0.56	1.11	0.58

Table AII-3.—Stadia Reduction—Continued

Minutes	28°		29°		30°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0.....	77.96	41.45	76.50	42.40	75.00	43.30
2.....	77.91	41.48	76.45	42.43	74.95	43.33
4.....	77.86	41.52	76.40	42.46	74.90	43.36
6.....	77.81	41.55	76.35	42.49	74.85	43.39
8.....	77.77	41.58	76.30	42.53	74.80	43.42
10.....	77.72	41.61	76.25	42.56	74.75	43.45
12.....	77.67	41.65	76.20	42.59	74.70	43.47
14.....	77.62	41.68	76.15	42.62	74.65	43.50
16.....	77.57	41.71	76.10	42.65	74.60	43.53
18.....	77.52	41.74	76.05	42.68	74.55	43.56
20.....	77.48	41.77	76.00	42.71	74.49	43.59
22.....	77.42	41.81	75.95	42.74	74.44	43.62
24.....	77.38	41.84	75.90	42.77	74.39	43.65
26.....	77.33	41.87	75.85	42.80	74.34	43.67
28.....	77.28	41.90	75.80	42.83	74.29	43.70
30.....	77.23	41.93	75.75	42.86	74.24	43.73
32.....	77.18	41.97	75.70	42.89	74.19	43.76
34.....	77.13	42.00	75.65	42.92	74.14	43.79
36.....	77.09	42.03	75.60	42.95	74.09	43.82
38.....	77.04	42.06	75.55	42.98	74.04	43.84
40.....	76.99	42.09	75.50	43.01	73.99	43.87
42.....	76.94	42.12	75.45	43.04	73.93	43.90
44.....	76.89	42.15	75.40	43.07	73.88	43.93
46.....	76.84	42.19	75.35	43.10	73.83	43.95
48.....	76.79	42.22	75.30	43.13	73.78	43.98
50.....	76.74	42.25	75.25	43.16	73.73	44.01
52.....	76.69	42.28	75.20	43.18	73.68	44.04
54.....	76.64	42.31	75.15	43.21	73.63	44.07
56.....	76.59	42.34	75.10	43.24	73.58	44.09
58.....	76.55	42.37	75.05	43.27	73.52	44.12
60.....	76.50	42.40	75.00	43.30	73.47	44.15
C = 0.75.....	0.66	0.36	0.65	0.37	0.65	0.38
C = 1.00.....	0.88	0.48	0.87	0.49	0.86	0.51
C = 1.25.....	1.10	0.60	1.09	0.62	1.08	0.64